

**Ministry of Agriculture Development (MOAD)
Nepal**

**THE PROJECT FOR
THE MASTER PLAN STUDY
ON
HIGH VALUE AGRICULTURE
EXTENSION AND PROMOTION
IN SINDHULI ROAD CORRIDOR
IN NEPAL
(SRCAMP)**

Final Report

Volume I Main Report

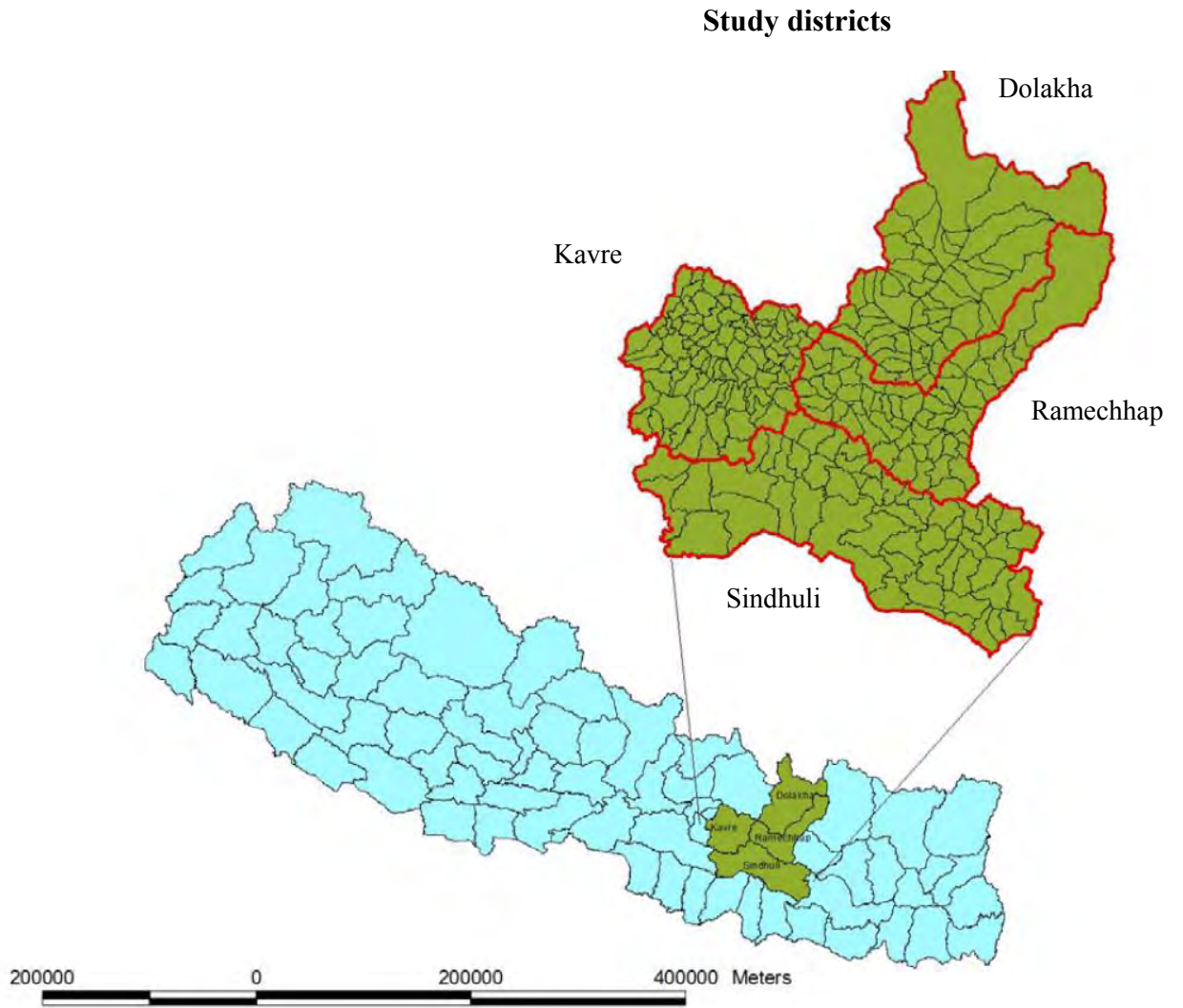
March 2014

Japan International Cooperation Agency (JICA)

KRI International Corp.

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Location Map



Photographs of Present Agricultural Conditions



Agricultural production is practiced commonly in terraced farm fields.



Most farmers raise animals combined with their crop farming.



Junar orchard on a steep slope



Milk collection system is well established compared with other products.



Both humans and animals are playing an important role in farming.



Agro-vets in local areas are supplying farm inputs both for crop and livestock farmers.

Photographs of the Pilot Projects



Integrated collection center system under Public-Private Partnership (PPP) approach



Multiple Water Utilization System (MWUS) supplying both for farming and domestic use



Farmer-trader interactive meeting to provide a meeting place for both parties



Unified standard production of vegetables for marketing purpose



Plastic house with drip irrigation system for tomato production



Improved feeding for livestock

**The Project for the Master Plan Study
on High Value Agriculture Extension and Promotion Project
in Sindhuli Road Corridor in Nepal
(SRCAMP)**

Final Report

SUMMARY¹

1. INTRODUCTION

1.1 Background

In Nepal, two-thirds of the population is engaged in agriculture, and the share of the agriculture sector in the gross domestic product (GDP) is about one-third. Most of the poor live in the rural areas with agriculture as their vital means of subsistence.

Nepal has different agricultural development approaches for the plain region and the hill and mountain area, which have different meteorological characteristics. While it is aimed to improve the productivity of staple foods such as rice and wheat by technical improvements in the plain region, high value commodities (HVCs) such as livestock products (mainly milk), fruit trees, and vegetables are promoted in the hill and mountain area. In the hill and mountain area, farming is practiced in small land plots on steep slopes. Moreover, the production of livestock products, fruits, and vegetables utilizing a variety of meteorological conditions and regional characteristics has higher potential than the production of staple foods. However, the infrastructure and institutions necessary for this approach, such as irrigation facilities and agricultural roads, agricultural technology and extension services, access to production inputs (fertilizers and seeds), and organization of farmers, have not been sufficiently developed in the area.

In the districts located in the hill area along Sindhuli Road, namely Kavrepalanchowk (hereafter referred to as “Kavre”), Dolakha, Ramechhap, and Sindhuli, it is expected that the opening of the road in 2015 would bring about secondary effects, including economic revitalization of the underdeveloped areas and improvement of livelihood. In order to prepare for the expected changes due to the opening of Sindhuli Road, the Government of Nepal (GON), with the technical assistance from the Japan International Cooperation Agency (JICA), launched the Project for the Master Plan Study on High Value Agriculture Extension and Promotion in the Sindhuli Road Corridor (SRCAMP) in June 2011 for a period of approximately three years.

¹ Section number of this Summary is not identical with that of main text, since some sections are omitted in editing process.

1.2 Objectives and Scope of the Study

The overall goal of the Study is to contribute to the livelihood improvement of the rural population in the Sindhuli Road Corridor (SRC) area through income generation by enhanced high value commercial agricultural production. The objective of the Study is to formulate the medium- to long-term plan to promote HVCs and to transfer relevant skills/technologies to the Nepali counterpart (C/P) personnel through joint work on basic information exchange, formulation of the Basic Development Strategy (BDS), implementation of pilot projects, and formulation of the Master Plan (M/P) with the Action Plan (A/P) and the Policy Matrix.

The Study consists of three phases as shown in Figure 1.1.

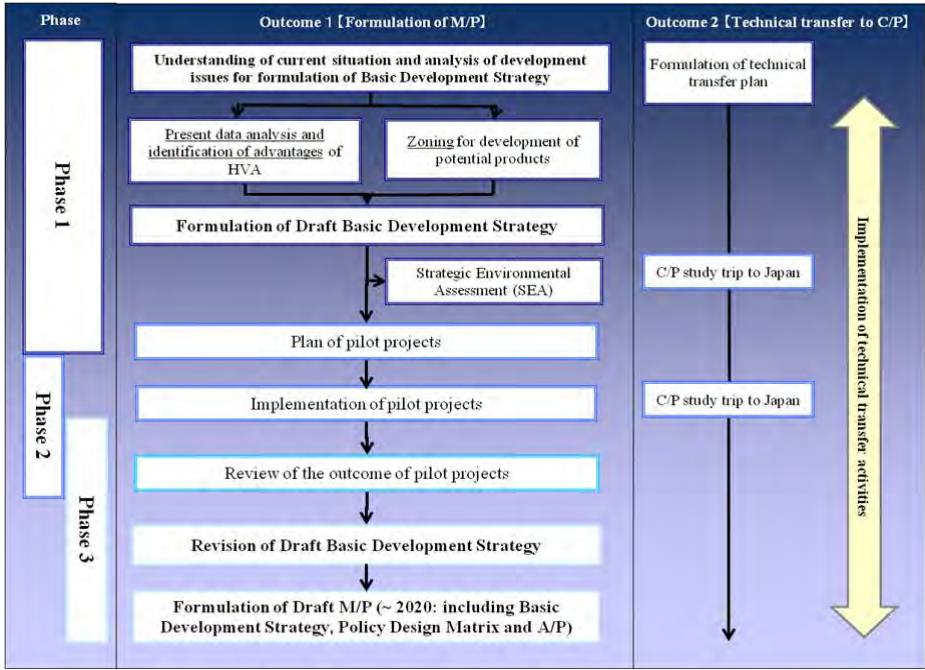


Figure 1.1: Work Flow by Outputs in Each Phase

1.3 Study Area

The study area covers the four districts in the SRC area, namely: Kavre, Dolakha, Ramechhap, and Sindhuli (refer to Figure 1.2). The study area is geographically and meteorologically diverse, i.e., the difference in elevation is approximately 6,900 m, ranging from 7,183 m in Dolakha District to 305 m in Sindhuli District. Likewise, precipitation and temperature vary within the area. It has an alpine climate in the Himalayas and subtropical climate in the lower hills and river banks. The variety of natural conditions in the area makes it possible to grow various crops, and also allows the production of off-season vegetables in the plains.

As for the social aspect, an outstanding characteristic in the study area is that the ethnic Tamang residents, which comprise only 5% of the total population in Nepal, account for around 30% of the population in Kavre and Sindhuli districts.

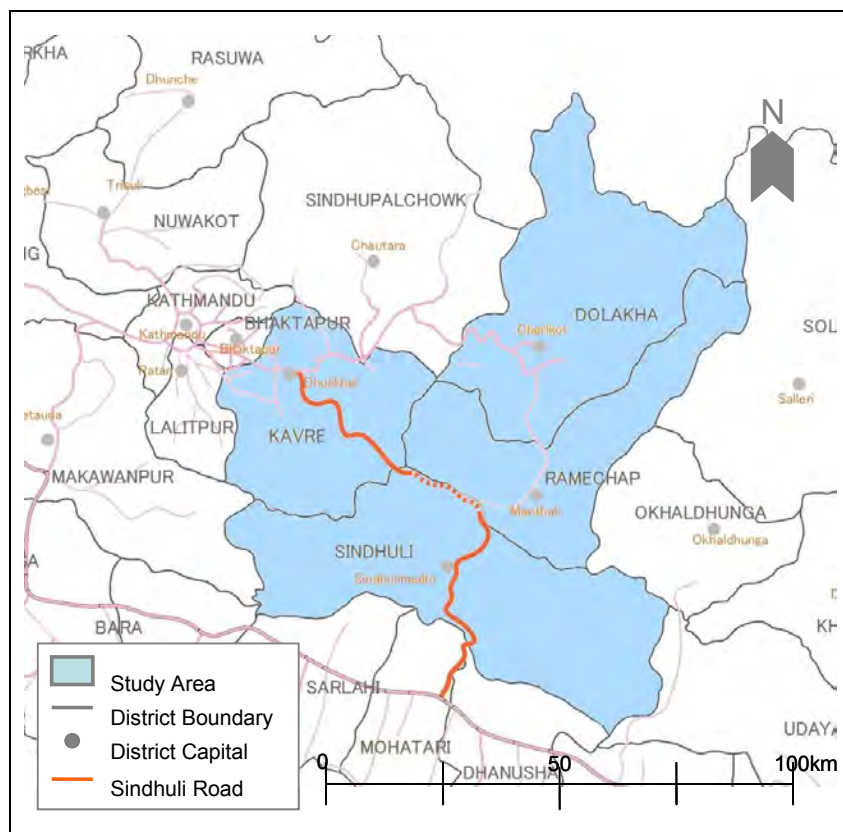


Figure 1.2: Location of Four Districts in the Study Area

Table 1.1 shows the basic information of the study districts.

Table 1.1: Basic Data of Study Districts

#	Particulars	Unit	Study Districts				Nepal
			Kavre	Dolakha	Ramechhap	Sindhuli	
1	Area	km ²	1,396	2,191	1,546	2,491	147,181
2	Population*	no.	381,937	186,557	202,646	296,192	26,494,504
3	Male*	no.	182,936	87,003	93,386	142,123	12,849,041
4	Female*	no.	199,001	99,554	109,260	154,069	13,645,463
5	Sex Ratio*	%	91.93	87.39	85.47	92.25	94.16
6	Total Households*	no.	80,720	45,688	43,910	57,581	5,427,302
7	Average HH size*	no.	4.73	4.08	4.62	5.14	4.88
8	Population density*	no./km ²	274	85	131	119	180
9	Proportion of urban population*	%	15.5	5.9		13.3	17.1
10	Literacy rate*	%	63.7	50.6	39	50.1	53.5
11	Poverty incidence**	%	13.9	26.0	25.6	38.3	25.2

Source: * CBS, 2012; ** CBS 2013 b.

2. OVERVIEW OF THE AGRICULTURE SECTOR IN NEPAL

2.1 Status of Agriculture in Nepal

The economy of Nepal is mainly based on agricultural production. About 90% of the population lives in rural areas whose key occupation is agriculture. In 2012/13, the agriculture and forestry sector provided 28.3% of the total GDP². The portion of agriculture sector in the total GDP has declined in recent years. The share of agriculture in GDP in 1990 was 49% but it has declined to just 28% in 20 years. Nevertheless, the role of agriculture still remains prominent, with around 74% of labor force, aged 15 years and above who are currently economically active, are employed in this sector³. Although the share of agriculture in the gross GDP has been declining, it is still the largest single sector of the economy. Besides being a major source of food and employment, this sector is also vital for the growth and development of the industrial and export sectors as both of these sectors are agriculture-based.

2.2 Main Challenge of the Agriculture Sector in Nepal

The main challenge of the agriculture sector in Nepal is ensuring the compatibility of food security and agricultural commercialization. Due to the low productivity of traditional crops, i.e., mainly minor grains in the hill and mountain areas, the shifting of production to horticultural crops such as vegetables and fruits utilizing the regional meteorological conditions is recommended. Therefore, the concept of agricultural commercialization in Nepal should be recognized not as commercialization with high-level processing such as agricultural mechanization or mass production, but as a measure to exit from low-level, subsistence agriculture.

2.3 Agriculture Policy, Acts, Rules, and Regulations

In Nepal, the 20-year Agriculture Perspective Plan (APP) is in operation since 1997 to accelerate agricultural growth for poverty reduction in a sustainable manner. Since 1997, Nepal's agriculture sector has been directed by this long-term plan. This plan provides a framework for the medium- and short-term plans, including the Ninth Plan (1997/98-2002/03), Tenth Plan (2002/03-2006/07), Three-Year Interim Plan (2007/08-2009/10), Three-Year Plan (2010/11-2012/13), and Thirteenth Three-Year Plan Approach Paper (2013/14-2015/2016).

In view of the termination of the 20-year APP period and to prepare for the promulgation of the long-term plan for the next 20 years for Nepal's agriculture sector after APP, the Asian Development bank (ADB) and several other donors have been assisting the government to prepare the Agriculture Development Strategy (ADS) with a view to increase the agriculture sector output that is more resilient to climate change. As for agricultural commercialization, the policy goal is to transform the agriculture sector from the subsistence level to a sector in which a vast majority of farming is carried out for commercial purposes and is connected to the local and national economies and markets.

² CBS, 2013a

³ CBS, 2009

2.4 Programs and Projects in line with the Policies

2.4.1 Government Commitment

The government plans to significantly increase its investment in the agriculture sector, i.e., from Rs.918.6 million in 2010/11 to Rs.1,341.4 million in 2013/14. In 2011/12, the government approved Rs.1,193.6 million of which about 75% (Rs.898.4 million) was provided by the government while the remaining 25% (Rs.295.2 million) was committed through donor assistance.

2.4.2 Pocket Package Strategy (PPS)

The PPS guidelines approved by GON as part of the packages of strategies for implementation of APP provide mechanisms and processes for the identification of production pocket areas. GON has given a high priority to horticultural crops and livestock as both are two priority outputs of APP.

2.5 Key Donor Projects in the Agriculture Sector

The major donors in the agriculture-related field (including livestock) in Nepal are ADB, the World Bank (WB), and the International Fund for Agricultural Development (IFAD). The Food and Agriculture Organization (FAO) also provides various types of technical assistance. As for the bilateral donors, UK, India, Japan, USA, Switzerland, Norway, and Germany are the main donors.

2.6 Institutional Structure and Arrangement for Agricultural Development

The institutional framework of the agriculture sector consists of: 1) the public sector institutions that are responsible for agricultural policy formulation, planning, implementation, agricultural research, and rural finance; 2) the non-government sector including a large number of non-governmental organizations (NGOs) and community-based organizations (CBOs) that are engaged in a wide range of rural development and agricultural service delivery activities; and 3) the private sector including mainly input suppliers, producers, processors, and traders.

2.7 Agricultural Production

2.7.1 Diversity of Crops based on Unique Physiographic Form and Agro-climatic Conditions

Cereals represent more than 75% of the total cropped area in Nepal followed by vegetables and fruits. Generally, Terai is known as the food basket and it is the principal area for cereal crop production. Likewise, the hill and mountain areas are appropriate for horticultural crops (fruits and vegetables) and the mountainous region for livestock.

2.7.2 Cultivated Land, Land Holding Size, and Tenancy

(1) Cultivated Land

The relatively higher portion of cultivated land lies in Terai (39.5%), followed by hills (27.5%) and mountains (4.0%). Out of the total cultivated land, more than half is located in Terai (51.7%) while very little in the mountains (8.3%).

(2) Land Holding Size, Distribution, and Land Tenancy

Land distribution in Nepal is highly skewed. More than two-thirds of the total landholders have less than 1 ha, and own only 30% of the total farm area. Their average land size is only 0.42 ha. On the other hand, 1.5% of the landholders own more than 5 ha, which cover 14% of the total farm area in Nepal. Land tenure information indicates that farm size is larger in Terai (1.29 ha) than in the hills (0.77 ha) or mountains (0.66 ha).

The dominant type of land entitlement in Nepal is owner-tiller. About 85% of the land is owner-operated and the remaining 15% is rented.

2.7.3 Production of Main HVCs

(1) Vegetables and Fruits

The production volumes of vegetables and fruits have grown over the last seven years at 7.5% and 8% per annum, respectively.

(2) Production of Livestock and Livestock Products

The productions of milk and meat have increased at a rate of 3.4% and 4.0% per annum, respectively, from 2003/04 to 2011/12.

2.8 Agricultural Inputs

2.8.1 Fertilizers

As the country does not produce chemical fertilizers, all fertilizers are imported. Most of the fertilizers are imported from India under a government-to-government system. The main public importer of chemical fertilizers in Nepal is the Agriculture Inputs Company Private Limited (AICL). Private traders are also allowed to import fertilizers, and in this case, fertilizers are distributed by district dealers to agro-vets or cooperatives to farmers. However, they would not be able to get subsidized fertilizers for sale, which means that fertilizers are legally controlled by AICL. The difference of fertilizer prices between India and Nepal has increased, and as a result, the fertilizer distribution system in Nepal has almost been nullified. Farmers in the Terai area have been getting fertilizers also through informal cross-border trade between the two countries.

2.8.2 Seeds

Unlike fertilizer, the seed sector is deregulated in Nepal. Private companies, farmers, and cooperatives can produce breeder, foundation, certified, and improved seeds. However, only the Nepal Agriculture Research Council (NARC) can produce breeder seeds.

2.8.3 Chemicals

All chemicals, including pesticides are handled by the private traders. There is no subsidy for pesticides. Importers registered under the Pesticides Registrar of the Department of Agriculture (DOA) import pesticides from India, China, and other countries and sell them to agro-vets and very rarely to agricultural cooperatives at wholesale prices.

2.8.4 Other Agricultural Materials and Equipment

For other agricultural materials and equipment, including pesticide application equipment, livestock medicines, animal feeds, and plastic sheets, there is no established system like those for seeds and fertilizers.

2.9 Agricultural Finance

Various models of microfinance such as Grameen Bank replication, financial intermediary NGO Model, and cooperative societies focusing on poor and microfinance have been operating. As of mid-July 2012, there are 24 microfinance development banks, 36 financial intermediary NGOs (FINGOs), 16 savings and credit cooperatives (SACCOs) with limited banking, and 11,851 SACCOs. Statistics showed that more than 1 million poor people have benefited from microfinance services. However, financial outreach to the rural poor is still only about half of the target needy groups due to inadequacy of microfinance services in terms of both service coverage and loan amount.

2.10 Agricultural Trade

Nepal's major trade partner is India in terms of the value account of both export and import, which is almost the same as or more than that of the other countries combined. Nepal's leading agricultural exports are herbs, pulses, cardamom, tea, ginger, betel nuts, beans, lentils, and oil cake. Nepal's major import commodities are rice, crude soybean oil, crude palm oil, vegetables, and fertilizers.

2.11 Demand of HVCs based on Turn Volumes

2.11.1 Arrivals of Vegetables, Fruits, and Spices in Kalimati Market

In order to know the demand trends for vegetables and fruits, the data on market arrival of HVCs was analyzed. The total volume of vegetables arriving in Kalimati Market, Kathmandu became almost double from 2005 to 2012. This reveals that the consumption of vegetable is rapidly increasing. The arrival of fruits in Kalimati Market has increased by 134% during the same period.

2.11.2 Arrivals of Vegetables and Fruits from SRC Districts to Kalimati Market

Out of the total market arrivals in Kalimati Market, nearly 12% of the agricultural produce comes from Kavre District while no information is available on market arrivals from other SRC districts. The produce originating from Dolakha might also have been included in the total products coming from Kavre because they arrive in Kalimati Market via Kavre.

2.11.3 Arrival of Goat in Kathmandu Market

The Kathmandu Chaupaya Kharid Bikri Private Limited holds over 90% share of goat sales in Kalanki Bazaar, the biggest goat market in Kathmandu Valley. In FY2011/12, 72% of handling goats are traded by the private company, almost 80% of which are imported from India and only 20% are domestic goats. This trend has not changed in the past three years.

2.11.4 Arrival of Milk in Kathmandu and Current Production Volume of SRC Area

The total volume of milk arriving in Kathmandu and its current production volume in SRC area are not clear as there is no appropriate data available. However, it is certain that the demand for milk in Kathmandu will increase as the population in Kathmandu Valley is rapidly increasing.

3. AGRICULTURAL DEVELOPMENT IN SRC DISTRICTS

3.1 District Level Agriculture Sector in SRC Districts

3.1.1 District Development Plans

The District Development Committee (DDC) is the local government responsible for formulating development policies, strategies, and plan; allocating and controlling resources; and monitoring the development activities in the district. DDC is also responsible for planning, implementing, managing, and monitoring agricultural development and extension, basic and primary education, and primary health care at the district level.

The district plans for the development of the agriculture sector for FY2012/13 revealed that the priority of all districts is improving the farmers' income through commercialization of the agriculture sector while supporting agricultural infrastructure development and market management.

3.1.2 District Agricultural Development Programs under District Agriculture Development Office (DADO)

Guided by district development priorities and demand from the Agricultural Service Centers (ASCs) and the Village Development Committees (VDCs), each DADO prepared a detailed annual plan of action, which revealed that citrus (mostly sweet and mandarin oranges) and vegetable development remain as the highly prioritized programs for commercial agricultural development in all districts. The total budget of DADO varies from Rs.22.7 million in Ramechhap to Rs.36.5 million in Sindhuli in FY2013/14. Less than one-fourth of the budget is spent on programs for all districts while the major portion of budget is spent on administration, especially on salary.

3.1.3 District Livestock Development Programs under District Livestock Service Office (DLSO)

As for the livestock sector, the total budget of DLSO varies from Rs.15.8 million in Dolakha to Rs.19.3 million in Kavre in FY2012/13. Less than one-fourth of the budget is spent on programs for all districts while the major portion of budget is spent on administration, especially on salary.

3.2 Agriculture Production in SRC Districts

3.2.1 Cultivated Area for Production in SRC Districts

(1) Cultivated Land

Ramechhap (40,050 ha) has the highest cultivated land, followed by Sindhuli (39,485 ha), Kavre (36,442 ha), and Dolakha (29,423 ha). Of the total agricultural land, more than half is cultivated

except in Dolakha.

3.2.2 Tenancy and Landholding in SRC Districts

The proportion of landless households in the study districts varied from 0.1% each in Kavre and Ramechhap districts to 0.6% in Dolakha District. The National Sample Census of Agriculture showed that two-thirds of households across all study districts own less than 1 ha of land. Very few farmers have more than 5 ha of land. These fragmented and small-size landholdings have been a challenge for increasing productivity.

In all the study districts, the average holding size is small and most of the lands are owned. The National Sample Census of Agriculture shows that more than 90% of land across all the study districts is owned by the owner themselves ranging from 96.5% in Dolakha to 99.5% in Ramechhap.

3.2.3 Diversity of Crops according to Different Climate and Altitude in SRC Districts

Cereal crops occupy more than two-thirds of the cropped areas in all the study districts. Next to cereal crops are cash crops followed by pulses and vegetables. Fruits are cultivated in relatively limited areas in all the study districts. In terms of the main cereal crops, maize, paddy, and wheat are grown in Kavre and Dolakha, maize and finger millet are grown in Sindhuli, while paddy and maize are grown in Ramechhap. These crops occupy more than 40% of the cropped area. The area for vegetables varies from 1.7% in Ramechhap to 12.5% in Kavre.

3.2.4 Change of Production of Agriculture and Livestock in SRC Districts

(1) Agricultural Production

All four districts increased their maize production in the last eight years. In Kavre District, the production of vegetables and potatoes dramatically increased, i.e., vegetable production almost tripled, potato production became double, and chili production in 2011/12 was 15 times higher than that in 2003/04. In Dolakha, potato, tropical fruits, and Junar production increased but not significantly; on the other hand, vegetable production decreased to less than half for some reasons. In Ramechhap, both rice and wheat production increased. Notable increase in the production of chili and ginger was seen. Production of vegetable and both deciduous and tropical fruits also increased. In Sindhuli District, vegetable production increased although not significantly. In comparison, the production of chili and ginger almost doubled. Tropical fruits, Junar, and orange production also increased in the last eight years.

(2) Livestock Production

In all four districts, the number of buffalo and goat produced has increased. Especially in Ramechhap and Sindhuli, the number of goat produced doubled in eight years. The number of poultry produced has quadrupled in Sindhuli, tripled in Ramechhap, and doubled in Kavre. This is due to the rapid development of the private poultry industry in Nepal. Milk production from both cow and buffalo has constantly increased as the number of animals increased in the last eight years.

3.3 Post Harvest Handling in SRC Districts

3.3.1 Processing

Post-harvest processing facilities are poorly developed in all the study districts. Very few small processing plants are located for local-level fruit processing, especially for Junar. Moreover, there are not known vegetable processing facilities. On the other hand, small dairy enterprises have been established for milk processing although the number is very small.

3.3.2 Market for Major Agricultural Products

Unlike processing facilities, substantial numbers of market facilities have been identified in the SRC districts. There are a total of 90 markets identified by DADO while there are 40 markets identified by DLSO in the SRC area.

3.4 Key Players in Agricultural Value Chains in SRC Districts

3.4.1 Public Sector

(1) District Agriculture Department Office

The main objective of DADO is to increase agricultural productivity and income through extension of improved technologies on various crops and thereby raising the living standards of farmers.

(2) District Livestock Service Office

The objective of DLSO is to increase the production of livestock products by diversifying and commercializing livestock activities at the district level and by making livestock income-oriented and a respectable occupation.

(3) DADO and DLSO Extension Services

At the district level, agriculture and livestock services are provided by the government staff assigned to DADO and DLSO. Field staff members (JT/JTAs) are posted at Service Centers (SCs) and Sub-service Centers (SSCs) from where they deliver services and provide some technical demonstrations to farmers. DADO and DLSO have 4-9 SCs and 7-13 SSCs in each district.

The extension services of DADO and DLSO face serious challenges and are weak in general. In particular, the following points need to be addressed for the promotion of agricultural commercialization in the SRC area:

- 1) Limited human resources (numbers),
- 2) Difficulty in movement, and
- 3) Limited capacity (technical).

(4) District Agriculture Development Committee (DADC)

In order to facilitate the coordination among the different agencies, avoid duplications, establish harmonies among the different agencies, and provide technical backstopping, the GON has formed a

DADC in each of the 75 districts to be chaired by the chairperson of the DDC. However, to date, DADC in general has not been able to carry out sound coordination that would generate synergy in the agricultural production and livelihood of the poor and disadvantaged farmers.

3.4.2 Producers' Groups

(1) Cooperatives

One characteristic common to all four districts is the limited number of vegetable and fruit producers' cooperatives involved in high value commodities. Kavre District has the highest number of registered agriculture-related cooperatives among the four study districts with 445 cooperatives, which is more than four times that of Ramechhap District with 98 cooperatives. In Ramechhap and Sindhuli districts, the number of registered cooperatives is relatively low. However, it is difficult to assess the activeness of these cooperatives due to the lack of sufficient information.

(2) Farmer Groups

All four study districts share a common trend on the agriculture-related farmer groups. The cereal crop and vegetable farmer groups are the majority, excluding multipurpose and integrated pest management (IPM) groups. Goat and buffalo livestock farmer groups account for over half of all livestock groups except in Kavre District.

It should be noted that the capacity of these groups may vary among districts; therefore, it may be difficult to capture the reality of farmer groups based solely on their numbers in the study districts.

Table 3.1: Number of Farmers' Groups in Study Districts

District	Category of Farmer Groups	Number of Groups	Total
Kavre	Agriculture/Farmer Groups	262	599
	Livestock Groups	337	
Dolakha	Agriculture/Farmer Groups	268	456
	Livestock Groups	188	
Ramechhap	Agriculture/Farmer Groups	129	240
	Livestock Groups	111	
Sindhuli	Agriculture/Farmer Groups	161	347
	Livestock Groups	186	

Source: DADO and DLSO District Profiles 2009/10 of Kavre, Dolakha, Ramechhap and Sindhuli districts

3.4.3 Agricultural and Microfinance Services in the SRC Districts

The three types of institutions that provide microfinance services in the study districts are 1) micro-credit bank, 2) cooperatives, and 3) financial NGOs. The detailed information on the status of activities performed by these organizations, in terms of the number of groups, persons, loan disbursement and repayment, is not available.

3.4.4 Input and Service Suppliers in the SRC Area

Input suppliers include fertilizer sellers, pesticide sellers, cooperatives, and agro-vets. These agents have been providing key inputs such as medicines, micronutrients, and vaccines to farmers. Agro-vets

are small or large retail and wholesale stores that sell agricultural inputs and products, including fertilizers, pesticides, seeds, small equipment, feeds, and medicines for livestock to general farmers. They not only sell products but also often provide technical advices to farmers. Their knowledge and technical capacity vary; nevertheless, they are important resources for farmers especially those who receive little extension services from the government.

Table 3.2 presents the number of agriculture and livestock-related agro-vets in the study districts.

Table 3.2: Number of Agriculture- and Livestock-related Agro-vets Operating in the Districts

District	Agriculture-related Agro-vets	Livestock-related Agro-vets
Kavre	70	49
Dolakha	125	38
Ramechhap	36	57
Sindhuli	34	39
Total	265	183

Source: Computed from Annual Progress Report of District Livestock Service Office, 2011/12 of respective districts (DLSO Kavre, 2011; DLSO Dolakha, 2011; DLSO Sindhuli, 2011; and DLSO Ramechhap, 2011)

3.4.5 Traders of Agricultural and Livestock Products in the SRC Area

Details on traders (agriculture and livestock products) are not available in the study districts because there is no system that registers them and monitors their businesses. Most producers, whether they are cooperatives, farmer groups, or individual farmers, make their own arrangements with the traders or traders visit them to collect the products. Therefore, getting district-level information on local, national, and international traders from the study districts is not possible.

3.4.6 Market Price Information Service for Producers

There are few organizations that compile and publish market price information for producers in the area. However, in reality, reliable market price information hardly reaches the producers. Therefore, they will need to use their own informal sources and channels to update themselves about the market prices of the different products that they handle through telephones particularly mobile phones, other producers, and businesses/traders.

3.4.7 Donor Agencies in the SRC Area

Some donor agencies and NGOs are involved in activities related to agricultural commercialization in the SRC area. They include ADB, WB, IFAD, European Commission (EC), Swiss Development Cooperation (SDC), USAID (United States Agency for International Development), and Plan Nepal. ADB operates in Dolakha District through its High Mountain Agribusiness and Livelihood Project (HIMALI Project); WB has started its Project for Agricultural commercialization and Trade (PACT) Program in all four districts in the end of 2013; IFAD is implementing its Leasehold Forestry and Livestock Program in all four districts; EC operates its UNNATI (means “wealth” in Nepali) Program through CARE Nepal in Sindhuli, SDC in Ramechhap, and USAID in Kavre although it has already been completed; and Plan Nepal operates its gender-oriented rural development activities in Sindhuli District.

4. POTENTIAL COMMODITIES, CONSTRAINTS AND POSSIBLE COUNTERMEASURES FOR AGRICULTURAL COMMERCIALIZATION IN THE STUDY AREA

4.1 Potential Commodities and Value Chain Studies

4.1.1 Preliminary Selection of Potential Commodities

In order to select the potential commodities for the detailed value chain assessment, an exercise to narrow down the number of probable HVCs was conducted. The products were identified and prioritized following the consultative processes. Brainstorming workshops with the district stakeholders, i.e., officials from DADO, DLSO, and District Forest Office (DFO), were carried out to identify and prioritize commodities. Decisions for prioritization and scoring are made through consensus.

4.1.2 Value Chain Study of Selected Commodities

Taking the results of the preliminary selection of potential HVCs into consideration, 11 commodities were chosen for the value chain study. Table 4.1 shows the list of these 11 HVCs.

Table 4.1: 11 HVCs Selected for Value Chain Study

#	Commodity Type	Commodity	Kavre District	Dolakha District	Ramechhap District	Sindhuli District
1	Vegetable	Potato	✓	✓	✓	✓
2	Vegetable	Tomato	✓	✓	✓	✓
3	Vegetable	Cauliflower	✓	✓	✓	
4	Vegetable	Cabbage	✓	✓	✓	
5	Fruits	Junar			✓	✓
6	Fruits	Orange	✓	✓		✓
7	Fruits	Pineapple				✓
8	Fruits	Lapsi	✓	✓		
9	Spice	Turmeric				✓
10	Livestock	Milk (buffalo, cow)	✓	✓	✓	✓
11	Livestock	Goat (meat)	✓	✓	✓	✓

4.1.3 Value Chain Study Results

Through the value chain studies, it became clear that constraints exist in each step of the value chain, ranging from inputs for production to marketing and distribution, with some similarity and variability among different HVCs.

It was confirmed that the functions performed by the existing market distribution system play a key role for commercialized commodities. Therefore, it should be regarded as indispensable for commercialization. The existing market distribution system as a whole is functioning through the interplay among value chain actors with each one of them shouldering its own shares of costs and risks. However, there are still various constraints that exist within the system.

The results of value chain studies in general reaffirmed that the improvement of accessibility through the Sindhuli Road and associated road networks will provide the study areas with opportunities to become good HVCs production sites. However, the results of value chain studies also suggested that it is essential to make multi-dimensional efforts in order for the areas to become reliable production sites, including ensured quality and stable supply, joint works among producers in various dimensions, and establishment of functional relations with market actors especially with and through intermediate players.

4.2 Main Constraints and Countermeasures for Agricultural Commercialization in the SRC Area

The constraints to agricultural commercialization in the study area are various in types and multi-tiered in their relations. However, the major constraints are considered to be in and around the “weak linkage in distribution system”. Figure 4.1 depicts the major constraints to agricultural commercialization based on the understanding of the Study Team.

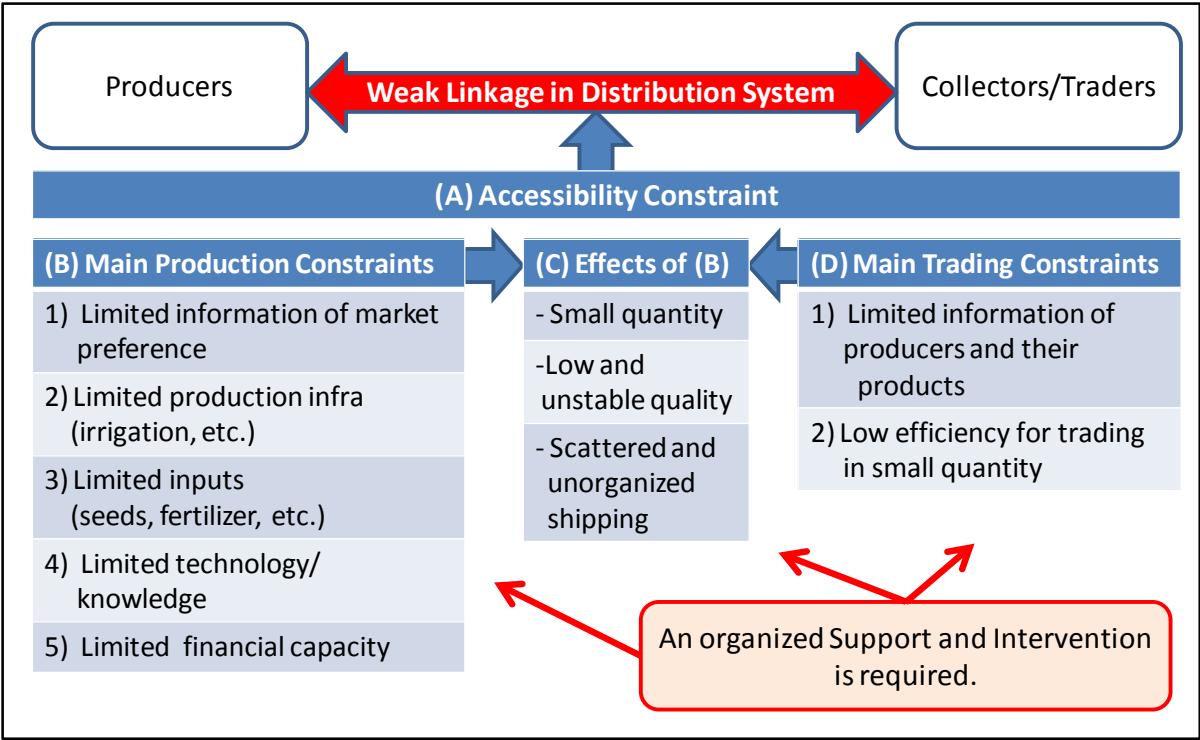


Figure 4.1: Major Constraints to Agricultural Commercialization in Study Area

The figure above does not include all the constraints identified in the course of the Study; rather, it highlights the most important constraint, i.e., weak linkage in the distribution system. In the figure, “(A) Accessibility Constraint” encompasses almost all other constraints as an umbrella constraint and directly contributes to the weak linkage in the distribution system. However, this accessibility constraint would be gradually alleviated through strategic and local road network improvements in the coming years. Provided that accessibility constraint will be alleviated, what remains as the most prominent constraint is “(C) Effects of (B)” in the same figure. In the eyes of collectors and traders

(that are reflections of consumers' preference and demands), HVC products in small quantity and low and unstable quality, and under scattered and unorganized shipping are not attractive for their business. Therefore, organized supports and interventions to address both production and trading constraints will be required in parallel to change the situation by maximizing the opportunity resulting from the accessibility improvement so as to strengthen the linkage in the distribution system.

In depth subsector-wise analyses of constraints and countermeasures were conducted for vegetables, fruits, livestock, and producers' organizations.

5. DRAFT BASIC DEVELOPMENT STRATEGY (DBDS) AND PILOT ACTIVITIES

5.1 DBDS for Agricultural Commercialization in the Study Area

Based on the discussions above, the DBDS aiming at agricultural commercialization in the study area towards 2020 was prepared in March 2012 as the preliminary basis of the M/P. The DBDS consists of the core, horticulture, livestock, and producer organizations strategies, as listed in Table 5.1.

Table 5.1: Draft Basic Development Strategy

Core Strategy	
Strategy 1:	<u>Promote the SRC area as the production center of HVCs especially that of vegetables, fruits, and milk, in order to supply the rapidly growing food demands in Kathmandu metropolitan area.</u>
Strategy 2:	<u>Promote the production of off-season vegetables and fruits</u> by taking advantage of agro-ecological features of the SRC area in order to supply the demands in Kathmandu metropolitan as well as Terai plain area.
Strategy 3:	<u>Strengthen both the "production" and "distribution" aspects of HVCs in a parallel manner</u> in order to carry forward the agricultural commercialization. The production aspect comprises production increase, quality improvement, and stable supply. The distribution aspect comprises efficient arrangement of distribution facilities and establishment of business linkages between producer organizations and private sector businesses.
Strategy 4:	<u>Focus on the creation of pro-private sector environment</u> in the SRC area in order to support the efficient involvement of private sector players. This is because in the strengthening of both "production" and "distribution" aspects, integrated efforts, e.g., technology, facility, and organizational and institutional aspect, will be required and the involvement of private sector players is considered indispensable.
Strategy 5:	<u>Work progressively in the areas where access, which is the prime condition for agricultural commercialization, will be improved</u> through road network improvements, taking the right crops for right lands into consideration.
Strategy for Horticulture (Vegetables)	
Vegetable 1:	Promote the growth of the SRC area as a major supply station of HVCs to Kathmandu Valley.
Vegetable 2:	Focus on the improvement of the marketing system.
Vegetable 3:	Strengthen the function of producers' organizations to deal with market players.
Vegetable 4:	Establish a strategic information flow between consumption and production areas.
Vegetable 5:	Produce quality products that are marketable and profitable for market players.
Strategy for Horticulture (Fruits) Strategy	
Fruits 1:	Develop marketing system of fruits.
Fruits 2:	Take into account the outflow trend of young males.

Fruits 3:	Focus on truly marketable fruit commodities.
Strategy for Livestock (Milk and Meat)	
Livestock 1:	Give priority to milk and goat meat for livestock development.
Livestock 2:	Give priority to ruminant animal over non-ruminant animal considering the feed resources of Nepal.
Livestock 3:	Put the highest priority on improvement of livestock productivity based on traditional ways of livestock rearing.
Livestock 4:	Take measures so as not to disturb the activities of the private sector in light of milk distribution.
Strategy for Producer Organizations	
Producer 1:	Transform agricultural cooperatives/groups from welfare service organizations into profit-making organizations.
Producer 2:	Guarantee stable supply to meet demand in the value chain.
Producer 3:	Conduct joint marketing work and build a trusting relationship with traders

5.2 Pilot Activities: Activities, Outcomes, and Lessons

5.2.1 Objectives of the Pilot Projects

The pilot projects were implemented in the study area from July 2012 to October 2013. The objectives of the pilot projects were: i) to verify the validity of DBDS; ii) to reflect the lessons obtained from the implementation of pilot projects into the revision of DBDS; iii) to establish the referential model in the promotion of HVCs; and iv) to develop the capacity of Ministry of Agriculture Development (MOAD) staff through their involvement in the planning, implementation, and management of pilot projects.

The pilot projects were prepared and implemented taking into consideration the multiple aspects of agricultural commercialization, e.g., facilities, technologies, marketing, and organization development. The pilot activities also tried to encompass the entire value chain to address bottlenecks in the promotion of HVCs so that the outcome of the pilot activities would help verify DBDS.

5.2.2 Composition of the Pilot Projects

The pilot activities consist of three categories, i.e., core, horticulture, and livestock, as listed in Table 5.2. These activities were designed to address the main constraints identified in DBDS. The two core pilot projects were implemented, combined with vegetable package, fruit package, milk package and/or goat package, depending on the commercialization model that each pilot site seeks for.

Table 5.2: Pilot Activities

#	CORE Pilot Projects		
C-1	Improvement of Agricultural Commercialization Support Service from DADO/DLSO		
C-2	Introduction of Integrated Collection Center System under Public-Private Partnership (PPP) Approach		
#	HORTICULTURE Pilot Activities	Vegetable package	Fruit package
H-1	Introduction of Unified Standard Group Production for Marketing	✓	✓
H-2	Introduction of the Multiple Water Utilization and Micro Irrigation System	✓	
H-3	Utilization of Rain-shed Plastic House	✓	
H-4	Quality Improvement of Seedlings and Saplings	✓	✓
H-5	Single Cropping and Tree Management for Citrus (especially Suntara)		✓
H-6	Appropriate Pruning and Thinning for Citrus		✓
H-7	Introduction of Unified Grading and Proper Packaging System	✓	✓
H-8	Junar Processing for Improvement of Storability and Transportability		✓

#	LIVESTOCK Pilot Activities	Milk package	Goat package
L-2	Development of Roughage and Concentrate Mixed Feeding	✓	
L-3	Fodder Yield Improvement by the Establishment of Technique by Utilizing Slope Area	✓	✓
L-4	Evaluation of Dairy Performance of Distributed Stud Bulls by Government	✓	
L-5	Monitoring of Candidate Breeding Buffalo Bull and Breeding Bull by Using Frozen Semen (Artificial Insemination: AI) for the Efficient Implementation of Genetic Improvement	✓	
L-6	Liver Fluke/Internal Parasite Control	✓	
L-7	Improvement of Housing of Milking Animal for Hygiene Control and Prevention of Mastitis	✓	
L-8	Improvement of Rearing Environment for Goats		✓
L-9	Improvement of the Local Practice of Goat Selection		✓
L-10	Establishment of Roughage-based Stall Feeding Technique		✓

5.2.3 Selected Pilot Sites

The five selected pilot sites are as shown in Table 5.3.

Table 5.3: Selected Pilot Project Sites with Combination of Pilot Activities

District	Pilot Sites (VDC)	Agricultural Commercialization Models to be Sought for	Core Pilot Activities	Horticulture Pilot Activities	Livestock Pilot Activities
Kavre	Bhimkhori	Commercialization model for temperate mountainous production pockets to supply off-season crops with improved accessibility.	✓	Vegetable Package	Dairy+Goat Packages
Dolakha	Bocha		✓	Vegetable Package	Dairy+Goat Packages
Ramechhap	Hattitar	Commercialization model for subtropical river bank production pockets with improved road accessibility	✓	Vegetable Package	Goat Package
Sindhuli	Ratamata		✓	Vegetable Package	-
	Ratanchura	Quality improvement and production stabilization model for Junar	✓	Citrus Package	Dairy+Goat Packages

5.2.4 Results from the Pilot Activities

The results of the pilot projects in general are satisfactory and support the validity of the approach listed in DBDS. The main lessons learned from each pilot project are briefly summarized in Table 5.4.

Table 5.4: Summary of Main Lessons from Pilot Project

Pilot Project	Relevance	Lessons
Core	C-1 Long-term programs are required	Extension capacity is very weak in Nepal, where both the number and technical skills of JT/JTAs have serious limitations. There were so many simple problems that could be solved by a simple advice. If there are few professionals in the area, many of the existing problems can be eliminated. They may not necessarily be government officers. The role could be borne by the private sector including agro-vets, if they have acquired better knowledge and skills.
	C-2 High direct impact observed	The key for a successful collection center is management. In order for both farmers and traders to gain more profits, the trust between them has to be built and efficiencies in production and marketing have to be improved. If reasonable profit is continuously generated, the activities at the collection centers will sustainably continue.

Pilot Project		Relevance	Lessons
Vegetable Package	H-1 H-3	Highly adoptable by local farmers and direct impact on cash income	Appropriate practice with very simple and basic techniques, like appropriate application of chemical fertilizer, introduced by the pilot method improved the volume of production up to 5 to 6 times compared to the traditional method. Because the risk of converting from cereal to vegetable production is high in the area, the basic livelihood of farmers, which depends on traditional cereal production and livestock activities, must be secured. Careful planning on how much the farmers can convert their traditional production system to vegetable production is necessary.
	H-1 H-6	Highly adoptable and visible direct impact in the short term	The number as well as the size of fruit is improved by proper fertilizer application. Thinning is recommended to have long-term benefit, but farmers were reluctant to do so because the effect is not visible within a short period. The greening disease infects citrus trees, which could totally deteriorate the whole production area. The problem could reach to the SRC area anytime.
Milk Package	L-2	High	Efficient use of roughage would lead to cost reduction. Further improvement of economic efficiency would be possible by the introduction of an appropriate feed formulation compatible with lactation stages and milk production.
	L-4 L-5	Moderate	Genetic improvement of dairy animals is strongly recommended for the improvement of farmers' income in the SRC area.
Milk and Goat Package	L-3	High	Availability of various fodders in the hill area provides a large potential for feeding ruminant animals. Farmers expressed significant interests in planting fodders within private lands for efficient feed collection. Appropriate technical assistance for the maintenance of newly introduced fodders and more efficient feeding techniques need to be extended to the farmers.
	L-6	Moderate	Liver Fluke (LF) is curable by a single dose of medicine (anthelmintics against LF). It is recommended to perform periodic examination and medication for prevention. It is also important to avoid feeding the animals with contaminated rice straws and paddy grasses.
Goat Package	L-10	High	In order to establish the goat production techniques for commercialization in the hill area where agriculture, livestock, and forestry are organically synchronized, it is necessary to establish a feeding technique in combination with production of high nutritious value fodder trees.
	L-9	Moderate	Deficiency of elite bucks is also significantly affecting the kidding interval. Therefore, the first priority should be placed on the selection of elite bucks within the area.

Introduction to the M/P

The M/P consists of: (1) Zoning and Development Scenarios for Identified Zones, (2) BDS, (3) Policy Matrix, (4) Project Long List, (5) Strategic Programming, and (6) A/P. The figure shown below explains the composition and the order of contents of the M/P, as well as the chapters where they are presented.

Zoning and Development Scenarios for Identified Zones: Firstly, the results of the several zoning attempts that were carried out for the Study will be briefly explained with emphasis on the last one which is based on “accessibility” and “agro-ecological aspects” as two important axes. Secondly, based on the zoning results, the development scenarios for the commercialization of the study area will be presented according to zone.

Basic Development Strategy: The development strategy for the agricultural commercialization of the study area proposed by this Study will be presented. The BDS is the updated version of the DBDS that the Study has previously proposed and revised based on the results and lessons obtained from pilot projects.

Policy Matrix: A matrix which consists of the excerpts of long-term policy directions of Nepal that relate to agricultural commercialization, combined with proposed goal, policy, and actions towards 2020 for the study area, will be presented.

Project Long List: A long list of projects related to the agricultural commercialization of the study area, which consists of newly proposed and ongoing government projects/programs and donor-supported projects, will be presented.

Strategic Programming: An analysis will be conducted on the long-listed projects by looking into the relationships and prospective synergies among them. This will be followed by the proposal of some selected projects to be implemented with prioritization among the newly proposed projects.

Action Plan: Based on the strategic programming, the Study proposes the A/P for selected projects.

Conclusion and Recommendation: The Study will draw a conclusion for this M/P and make a recommendation for the parties concerned.

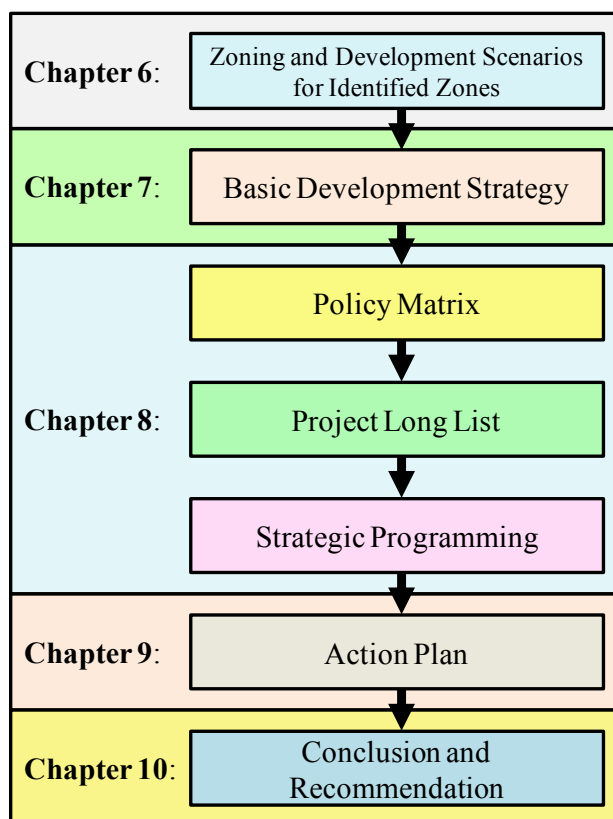


Figure: Outline of the M/P

6. ZONING OF THE STUDY AREA AND DEVELOPMENT SCENARIOS FOR IDENTIFIED ZONES

6.1 Zoning for the M/P

The zoning of the study area has been carried out to identify areas with high prospects of agricultural commercialization using various types of information. The main purpose of zoning under the Study is to identify the different locations in the study area suitable for commercialization by producing HVCs through utilizing both spatial and attribute data.

The zoning exercise adopted the accessibility aspect as the primary variable, combined with the agro-ecological aspect as secondary variable. The accessibility aspect has surfaced as the fundamental and necessary condition for agricultural commercialization during the preparation stage of DBDS, while the agro-ecological aspect is found useful in considering the seasonality (i.e., cropping calendar and/or varieties) of the productions in the identified pockets. Based on the abovementioned notion, **the Study aimed at classifying the agricultural lands in the study area using two axes, i.e., “accessibility level” and “agro-ecological regions”.**

The Study initially conducted the zoning of agricultural land considering the agro-ecological aspect (i.e., land use, climatic region, land capability, and soil texture) then moved to the identification of potential production pockets considering the accessibility situation.

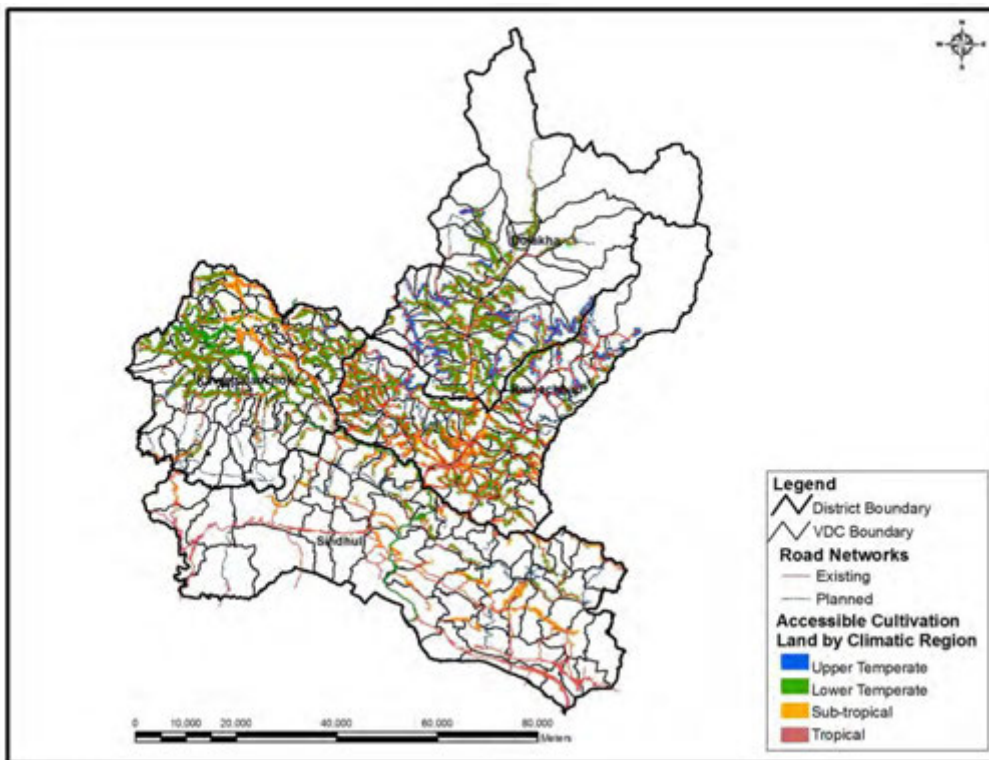
After going through the steps, the agricultural lands in the study area were classified based on accessibility level and climatic regions, as presented in Table 6.1.

Table 6.1: Accessibility Situation of Agricultural Lands by Climatic Region

Climatic Zone \ Accessibility		Accessible Agriculture Area		Likely Accessible Agriculture Area		Inaccessible Agriculture Area		Total	
		Area (ha)	%	Area (ha)	%	Area (ha)	%	Area (ha)	%
Upper temperate (2,000–3,000 m)	Area (ha)	9,008	48.0	543	2.9	9,213	49.1	18,764	100.0
	%	12.0		11.6		15.7		13.6	
Lower temperate (1,000–2,000 m)	Area (ha)	50,221	55.7	3,172	3.5	36,751	40.8	90,145	100.0
	%	66.6		67.8		62.7		65.0	
Subtropical (500–1,000 m)	Area (ha)	12,225	52.1	887	3.8	10,363	44.1	23,475	100.0
	%	16.2		19.0		17.7		16.9	
Tropical (0–500 m)	Area (ha)	3,917	62.6	74	1.2	2,265	36.2	6,256	100.0
	%	5.2		1.6		3.9		4.5	
Total	Area (ha)	75,371	54.4	4,677	3.4	58,592	42.2	138,640	100.0
	%	100.0		100.0		100.0		100.0	

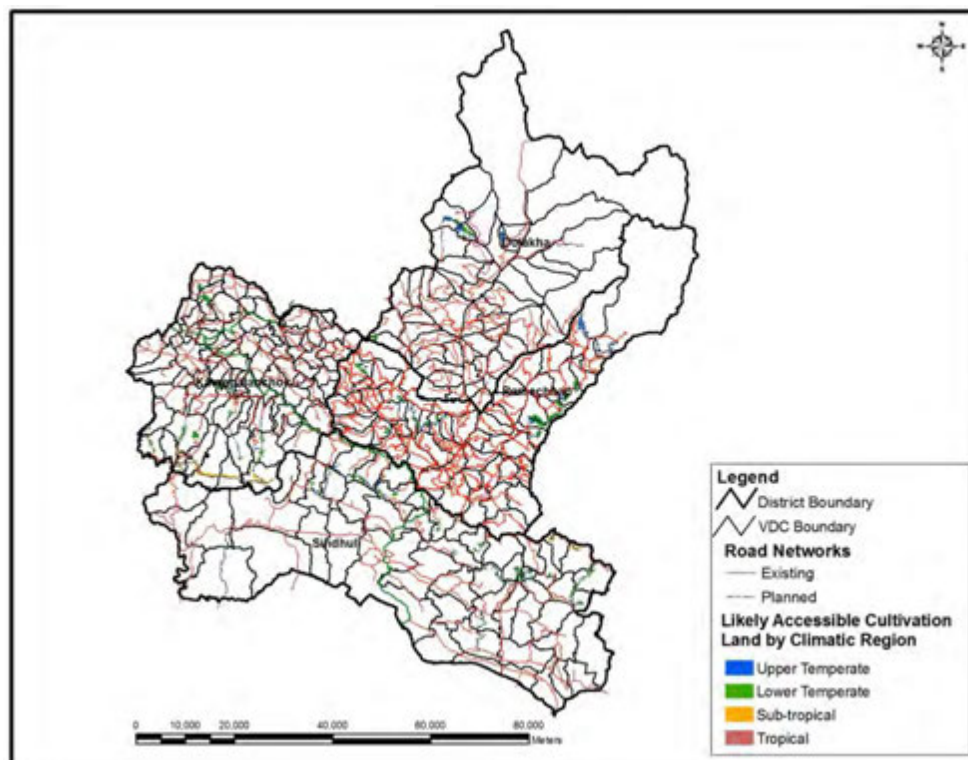
Source: Study Team

Maps 6.1 and 6.2 present the accessible and likely accessible agricultural lands suitable for cultivation by climatic regions and districts, respectively. Comparing these two maps, the likely accessible agricultural lands in the study area are not much because the data that the Study utilized for the planned road construction cover until 2018 only.



Source: Study Team

Map 6.1: Accessible Agricultural Lands Suitable for Cultivation by Climatic Regions



Source: Study Team

Map 6.2: Likely Accessible Agricultural Lands Suitable for Cultivation by Climatic Regions

6.2 Development Scenarios for Identified Zones

6.2.1 Application of the Zoning Results for the M/P

The results of the zoning attempt presented above focused on the accessibility aspect, which is generally considered as the fundamental and primary condition necessary for agricultural commercialization. Also, the major premise of this Study is based on maximizing the benefits of accessibility improvement associated with the Sindhuli Road construction. Hence, focusing on the accessibility aspect in zoning is considered appropriate.

While these zoning results did not clearly delineate the particular zones shown with circles or colors with particular characteristics and recommend producing particular HVC, the Study believes that this zoning is comparably more practical. The Study came into a conclusion that the selection of particular HVC for particular pockets should be decided based on the careful assessment of market signals against various related conditions, e.g., accessibility, land, water, climate, and labor.

The zoning under the Study enabled the general understanding of the accessibilities and various types of agricultural lands distributed within the study area. For the next step, it is proposed to strategically plan and implement the agricultural commercialization activities along the routes based on the stability of transportation, aggregate size of agricultural lands, and considerations of climatic aspects.

6.2.2 Development Scenarios for Each Identified Zones

The zones identified based on the accessibility and agro-ecological aspects can be divided into a maximum of 12 zones (three for accessibility and four for climatic regions). However, for practicality, the 12 zones are further grouped into five zones, which are as follows:

Zone 1: Accessible/Temperate (by merging the upper and lower temperate climates)

Zone 2: Accessible/Subtropical (by merging tropical and subtropical climates)

Zone 3: Likely Accessible/Temperate (same as Zone 1)

Zone 4: Likely Accessible/Subtropical (same as Zone 2)

Zone 5: Not accessible (by merging all four climates)

The scenarios for the development of each zone aiming at agricultural commercialization under this M/P were also deliberated in line with accessibility and agro-ecological aspects. As a result, they turned out to be rather simple scenarios.

Table 6.2 presents the zoning of the study area according to accessibility and agro-ecological aspects, with the proposed development scenarios for agricultural commercialization towards 2020.

Table 6.2: Zoning of the Study Area with the Proposed Development Scenarios for Agricultural Commercialization towards 2020

	Accessible (area with year-round accessibility)	Likely Accessible (including area with seasonal roads)	Not Accessible (area with no prospects for access improvement until 2020)
Pockets in Temperate Climate	Zone 1: Accessible/Temperate	Zone 3: Likely Accessible/Temperate	Zone 5: Not Accessible
	Proposed Scenario: By taking advantage of temperate climate, strive to develop as the reliable production area of off-season crops.	Proposed Scenario: Join to the Zone 1 category when accessibility is improved.	Continue subsistence agriculture while taking advantage of forestry resources where possible, by striving for Non-Timber Forest Product (NTFP) production and goat rearing through community forestry type activities.
Pockets in Subtropical Climate	Zone 2: Accessible/Subtropical	Zone 4: Likely Accessible/Subtropical	
	Proposed Scenario: By taking advantage of relative competitiveness in accessibility, strive to develop as the reliable production area of vegetables.	Proposed Scenario: Join to the Zone 2 category when accessibility is improved.	

Source: Study Team

The main pillar of the scenarios presented above is accessibility as it has been repeatedly emphasized in this Study to be the fundamental and most practical condition for commercialization. Realistically speaking, the Study considers putting this aspect at the center especially because major changes in this aspect are taking place in the study area as a result of improved connectivity with major consumer markets.

Hence, the scenarios for commercialization are to proceed in a progressive manner from where better accessibility is achieved in the study area, through well thought-out and concerted efforts among the concerned stakeholders. The areas where the accessibility improvements will not take place before 2020 should opt for alternative approaches for commercialization considering their resource endowments, generally through forests and NTFPs.

7. BASIC DEVELOPMENT STRATEGY FOR AGRICULTURAL COMMERCIALIZATION OF THE STUDY AREA

7.1 Agricultural Commercialization under BDS

The definition of agricultural commercialization in the context of Nepal presented in Section 2.2 has been consistently followed throughout this Study, and all the analyses, activities, and planning have been based on this definition, as follows:

“Agricultural commercialization” in Nepal is a concept to be recognized not as commercialization with high-level processing such as agricultural mechanization or mass production, but as a measure to exit from low-level subsistence agriculture.

7.2 Review of the DBDS

Based on the DBDS formulated in March 2012, a set of pilot projects has been implemented in order to examine the validities of strategies listed in DBDS. Pilot projects were small in scale but attempted to include as much aspects as possible from DBDS. Although there were a number of lessons learned after the pilot project implementation, the basic outcomes expected in the pilot projects have been achieved. It can be said that the outcomes from the pilot projects support the DBDS. Hence, the concepts proposed in DBDS will be basically carried over to BDS with minor revisions.

The minor revisions given to DBDS in order to update it as BDS are listed in Table 7.1.

Table 7.1: Alterations Made on DBDS

#	Strategies	Parts of DBDS Altered in the Process of Updating DBDS to BDS
1.	Core Strategy	<ul style="list-style-type: none"> Reordered the strategies by listing the broader strategy first and the more specific strategy last. Minor rewordings to specify the scopes and clarify the expressions to be more comprehensible. Added another core strategy emphasizing on the balance and speed of commercialization, based on the lessons learned from the pilot projects.
2.	Strategy for Vegetables ⁴	<ul style="list-style-type: none"> Minor rewordings to specify the scopes and clarify the expressions to be more comprehensible. Strategies 2 to 4 in DBDS touching upon marketing aspect have been merged as Strategy 2 of BDS. Hence, the number of strategies for vegetables was reduced from five to three.
3.	Strategy for Fruits	<ul style="list-style-type: none"> Deleted a strategy concerning the outflow of population and included this element in the newly added core strategy. Merged two strategies concerning the promotion and marketing of fruits. Hence, the number of strategies for fruits was reduced from three to one.
4.	Strategy for Livestock	<ul style="list-style-type: none"> Reordered the strategies by listing the broader strategy first and the more specific strategy last, while rewording the strategy on livestock marketing.
5.	Strategy for Producer Organizations	<ul style="list-style-type: none"> No alteration.

7.3 Outline of BDS

The outline of the BDS that the Study Team proposes for the agricultural commercialization in the study area towards 2020 is presented in Table 7.2.

Table 7.2: Basic Development Strategy

Core Strategy	
BDS CO-1:	<u>Work progressively in the areas where access, which is the prime condition for agricultural commercialization, will be improved</u> through road network improvements, taking the right crops for the right lands into consideration.
BDS CO-2:	<u>Promote the SRC area as a production center of HVCs</u> especially that of vegetables, fruits, and milk, in order to supply the rapidly growing food demands in the Kathmandu Valley area.
BDS CO-3:	<u>Promote the production of off-season vegetables</u> by taking advantage of agro-ecological features of the SRC area, in order to supply the demands in Kathmandu Valley as well as in the Terai plain areas.

⁴ Vegetables include some spice crops such as ginger, turmeric, onion, garlic, and chili.

BDS CO-4:	<u>Strengthen both the “production” and “distribution” aspects of HVCs in a parallel manner</u> in order to carry forward the agricultural commercialization. The production aspect comprises production increase, quality improvement, and supply stability. The distribution aspect comprises efficient arrangement of distribution facilities and establishment of business linkages between producer organizations and private sector businesses.
BDS CO-5:	<u>Focus on the promotion of private sector involvement</u> in the SRC area. This is because in the strengthening of both “production” and “distribution” aspects, integrated efforts, e.g., technology, facility, and organizational and institutional aspects, will be required and the involvement of private sector players is considered indispensable.
BDS CO-6:	<u>Pay due attention to the vulnerability of farm economy and labor constraints, as well as the speed of commercialization in order not to impose excessive risks to households.</u> Balance of various income sources, e.g., agriculture and livestock, as well as others should be taken into account to secure the economic resilience of smallholders.
Strategy for Horticulture (Vegetables and Fruits)	
BDS HO-1:	Promote the growth of SRC area as the major supply station of HVCs to Kathmandu Valley and for off-season crops to the Terai Region.
BDS HO-2:	Strengthen the marketing system of HVCs through capacity development of producer groups for their improved bargaining power in relation with other market players and establish in parallel the two-way information flow between farmers and consumers.
BDS HO-3:	Promote the stable supply of quality produce that are marketable and profitable for market players.
Strategy for Horticulture (Fruits only)	
BDS HO-4:	Focus only on truly marketable fruit commodities and concentrate on their marketing.
Strategy for Livestock (Milk and Meat)	
BDS LI-1:	Put the highest priority on improvement of livestock productivity based on traditional ways of livestock rearing.
BDS LI-2:	Give priority to ruminant animals over non-ruminant animals considering the feed resources of Nepal.
BDS LI-3:	Give priority to milk and goat meat for livestock development.
BDS LI-4:	Work through existing systems for milk and goat meat marketing.
Strategy for Producer Organizations	
BDS PG-1:	Transform agricultural cooperatives/groups from welfare service organizations into profit-making organizations.
BDS PG-2:	Guarantee stable supply to meet demand in the value chain.
BDS PG-3:	Conduct joint marketing work and build a trusting relationship with traders.

8. POLICY MATRIX, PROJECT LONG LIST AND STRATEGIC PROGRAMMING

8.1 Policy Matrix for the Agricultural Commercialization in the Study Area

Table 8.1 in the main text shows the policy matrix developed based on the development scenarios resulting from zoning as well as from BDS.

8.2 Long List of Projects

The long list of projects compiled for the M/P consists of 30 projects: among them, ten are newly proposed by the Study, seven are ongoing government projects/programs, and thirteen are either ongoing or under preparation with the support of donors. The reason why this long list includes ongoing projects implemented either by government or donors is that, in order to understand the whole picture of the agricultural commercialization prospects in the study area as if it is one large program (i.e., a set of multiple projects), ongoing and planned activities concerning commercialization need to be looked at simultaneously, taking into account relationships such as synergies and complementarities among projects.

Hence, although each of the ten newly proposed projects is independent, they have productive relationships with other ongoing and/or newly proposed projects. This means that newly proposed projects are designed as pieces that fit into one large picture of agricultural commercialization prospects for the study area towards 2020.

Table 8.1 presents the long list of projects considered for the M/P.

Table 8.1: Long List of Projects for the M/P

#	VC*	Code**	Project Name	Implementing Body	Stage***
1. Newly Proposed Projects by the Study					
1	U/M/D	HO-1	Sindhuli Road Corridor Commercial Agriculture Promotion (SRCCAP)	DOA	New
2	U	HO-2	Strengthening of Junar Production System	DOA	New
3	U	HO-3	Non-conventional Irrigation	DOA, Department of Local Infrastructure and Agricultural Road (DOLIDAR)	New
4	M	HO-4	Kurkhot Logistics Center and Associated Distribution Network	MOAD	New
5	D	HO-5	New Vegetables/Fruits Wholesale Market in Eastern Kathmandu	MOAD	UP
6	U/M/D	HO-6	Study for NTFP Promotion	Ministry of Forest and Soil Conservation (MOFSC)	New
7	U/M	LI-1	Sindhuli Road Corridor Traditional Livestock Production Strengthening (SRCTLPS)	Department of Livestock Services (DLS)	New
8	U	LI-2	Genetic Improvement and Breeding of Dairy Animals	DLS	New
9	U	LI-3	Genetic Improvement and Breeding of Goats	DLS	New
10	U	LI-4	Consignment Mating of Dry Buffaloes for Milk Production and Genetic Improvement - Pilot	DLS	New
2. Project/Programs Implemented by GON					
11	U	GO-1	Continuous Expansion of Agricultural Services by DADO	DOA (DADO)	OG, UP
12	U	GO-2	Continuous Expansion of Livestock Services by DLSO	DLS (DLSO)	OG, UP
13	U	GO-3	Strengthening of the Functions of Agriculture and Livestock Development Centers in the Study Area	DOA, DLS	OG, UP

#	VC*	Code**	Project Name	Implementing Body	Stage***
14	M/D	GO-4	Establishment of Fruits Juice Processing Plant	DOA, Federation of Nepalese Chambers of Commerce and Industries (FNCCI)/ Agri Enterprise Center (AEC), Junar Central Coop., Producer Groups/Coops.	OG
15	U/M/D	GO-5	One District One Product (ODOP) Program	DOA, FNCCI/AEC, Central/District Level ODOP Committees	OG
16	—	GO-6	Road Network Improvements (three bridges across major rivers by Department of Road (DOR), rural roads based on District Transport Master Plans (DTMPs) 2014-2018)	DOR, DOLIDAR, DDC, VDC	OG
17	—	GO-7	Panchkhar SEZ (Kavre)	Ministry of Industry (MOI)	OG
3. Projects/Programs with Donor Supports					
18	U/M/D	DN-1	High Mountain Agribusiness and Livelihoods Improvement Project (HIMALI) (Dolakha)	DOA, ADB	OG (LN+TA)
19	U	DN-2	Community-Managed Irrigated Agriculture Project (CMIASP) Supports for famer-managed irrigation systems (FMIS)	DOI, ADB	OG (LN)
20	—	DN-3	Roads Connectivity Sector I (including Bridge across the Sunkoshi River in Kurkhot)	DOR, ADB	OG (LN)
21	U/M/D	DN-4	Project for Agricultural Commercialization and Trade (PACT) (started operation in the SRC area in late 2013)	DOA, WB	OG (LN+TA)
22	U	DN-5	Poverty Alleviation Fund Project II (Small Irrigation Development in four districts)	WB, IFAD	OG (LN)
23	U	DN-6	Leasehold Forestry and Livestock Program (LFLP)	MOFSC, Department of Forest (DOF), DLS	OG (LN)
24	U/M/D	DN-7	Rural and Agricultural Development Project in Ramechhap District	DOA, SDC	UP (TA)
25	U	DN-8	Vegetable Seed Project in Ramechhap, Phase 3	DOA, SDC	OG (TA)
26	U/M/D	DN-9	Girls Power Project	Plan Nepal	OG (TA)
27	—	DN-10	Volunteer Programs (JOCV, SV)	JICA	OG (TA)
28	U/M	DN-11	Establishing Sustainable Production and Supply System for High Value Agricultural Crops in the Hilly Areas of Sindhuli District	GLMI, local NGO	OG (TA)
29	U/M/D	DN-12	UNNATI	EU, CARE Nepal, CEAPRED	OG (TA)
30	D	DN-13	Market Information Improvement (within the framework of Raising Incomes of Small and Medium Farmers Project (RISMF))	ADB, FNCCI/AEC	OG (LN)

* VC = Value Chain, U = Upstream, M = Midstream, D = Downstream

** HO = Horticulture (and related) projects, LI = Livestock projects, GO = Government projects, DN = Donor-assisted projects

*** OG = Ongoing, UP = Under Planning, (TA) = Technical Assistance, (LN) = Loan

Source: Study Team

The projects in the long list are diverse in terms of not only their sectors and contents but also geographical coverage, positions in the value chain, implementation period, implementation organization, and their modalities.

The projects which are ongoing and under the pipeline for the M/P of SRCAMP are the given conditions that need to be taken into account. Hence, the discussion for the A/P will proceed by taking ongoing and under planning projects as “given” and focusing only on newly proposed projects by the Study.

8.3 Strategic Programming for the A/P

8.3.1 Logical Grounds for the Strategic Programming

There are ten newly proposed projects in the Study, six of which are assigned with an “HO” code because they are related to the horticulture subsector, while four are assigned with an “LI” code as they are related to the livestock subsector. However, their characteristics differ in various aspects and therefore, brief explanations of their differences are described in Table 8.2 below.

Table 8.2: Brief Descriptions of Newly Proposed Projects for SRCAMP M/P

#	Code	Project Name	Brief Description
1	HO-1	Sindhuli Road Corridor Commercial Agriculture Promotion (SRCCAP)	<ul style="list-style-type: none"> • Expansion of SRCAMP’s pilot approach for vegetable production and marketing through collection center arrangement. • This project addresses the development scenario for Zones 1 to 4.
2	HO-2	Strengthening of Junar Production System	<ul style="list-style-type: none"> • Introduction of the basic cultivation techniques of Junar, e.g., sapling, applying proper fertilizer and agro-chemicals, thinning, and pruning. • This project addresses the production aspect of the development scenarios for Zones 1 and 3.
3	HO-3	Non-conventional Irrigation	<ul style="list-style-type: none"> • Installation of irrigation systems that utilize the perennial mountain streams in mid-hill areas. • This project aims at addressing the production aspect of the development scenarios for Zones 1 to 4.
4	HO-4	Kurkhot Logistics Center and Associated Distribution Network	<ul style="list-style-type: none"> • Feasibility study and implementation for the potentiality of Kurkhot to function as an important logistics center after the completion of the nearby bridge crossing the Sunkoshi River, combined with the efficiency improvement of associated distribution network. • This project enhances the effectiveness of the development scenarios for Zones 1 to 4.
5	HO-5	New Vegetables/Fruits Wholesale Market in Eastern Kathmandu	<ul style="list-style-type: none"> • This project is under planning by GON but its site has not yet been secured. Once the site issue has been cleared, it should start with the study, which will be followed by implementation. • Although this project is not located within the study area, this wholesale market is expected to function as an eastern gate of the capital’s consumer market and enhance the effectiveness of the development scenarios for Zones 1 to 4.
6	HO-6	Study for NTFP Promotion	<ul style="list-style-type: none"> • A study to verify the potential of NTFP promotion in the study area, from resource endowments to marketability. • This project aims at addressing the development scenario for Zone 5.
7	LI-1	Sindhuli Road Corridor Traditional Livestock Production Strengthening (SRCTLPS)	<ul style="list-style-type: none"> • Expansion of SRCAMP’s pilot approach for livestock sector (milk and goat). Alignment with HO-1 during implementation is desirable. • This project addresses the development scenarios for Zones 1 to 4.
8	LI-2	Genetic Improvement and Breeding of Dairy Animals	<ul style="list-style-type: none"> • Improvement of the system for genetic improvement and breeding of dairy animals. • This project encompasses the development scenarios for all five zones but more effective in Zones 1 to 4.

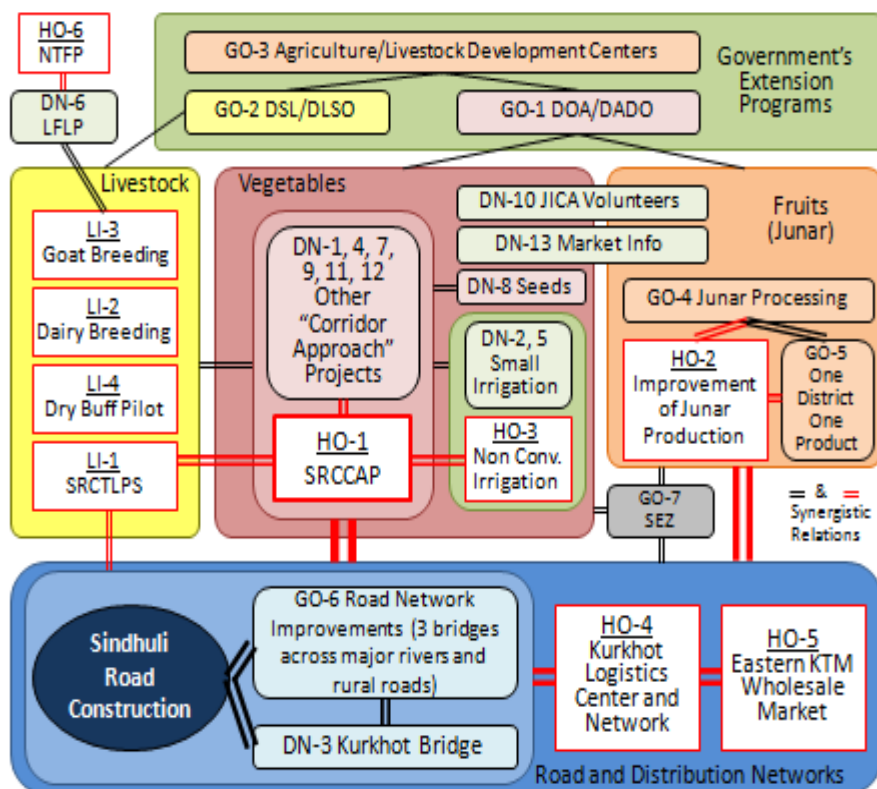
#	Code	Project Name	Brief Description
9	LI-3	Genetic Improvement and Breeding of Goats	<ul style="list-style-type: none"> Improvement of the system for genetic improvement and breeding of goats. This project encompasses the development scenarios for all five zones.
10	LI-4	Consignment Mating of Dry Buffaloes for Milk Production and Genetic Improvement – Pilot	<ul style="list-style-type: none"> Feasibility study of pilot project to verify the introduction of a new system of consigning dry buffaloes to a place where the elite stud bulls are kept. Genetic improvement and milk production increase are sought for in parallel through this activity. This project encompasses the development scenarios for all five zones but more effective in Zones 1 to 4.

Source: Study Team

The ten newly proposed projects cover different subsectors while they are more or less interrelated with each other as well as with other ongoing projects. In order to consider the priorities among them, the Study adopted a qualitative approach that contemplates the effective and strategic programming of the proposed projects based on their relationships with enhanced connectivity through the completion of Sindhuli Road and associated road networks. In doing so, the relative importance of each newly proposed project was evaluated, taking into account the prospective synergies/complementarities that can be generated among the projects, in addition to social and economic impacts.

8.3.2 Strategic Programming from Synergy Aspect

Figure 8.1 shows the relationship among the 30 long-listed projects.



Source: Study Team

Figure 8.1: Relationship among 30 Long-listed Projects

Figure 8.1 explains the relationships, mainly in terms of synergies, that the long-listed projects can

generate together. The dual lines in the figure means there are synergistic relations between the projects while their widths represent the strengths of expected synergies. The dual lines in red color means that they are connected in one or two ways with newly proposed projects, which are also shown with red colored boxes.

Some remarks with regard to Figure 8.1 are presented below.

- The projects placed at the bottom of the figure, grouped as “Road and Distribution Networks”, are infrastructure projects including the Sindhuli Road construction which serves as the major premise of this M/P. Other road and bridge projects combined with Sindhuli Road will enhance the connectivity of the study area. Kurkhot Logistics Center (HO-4) and Eastern Kathmandu Wholesale Market (HO-5) have the synergistic relations with road networks as their precondition. Other subsectors that are placed in the middle section of the figure also have synergistic relations with “Road and Distribution Networks”, especially in the case of the vegetables subsector.
- In the vegetables subsector, there exists a group of projects that can be categorized into one, with their commonality of more or less taking advantage of the improved accessibility (or connectivity) of the area. They can be tentatively named as “corridor approach projects”. One of the newly proposed projects, tentatively named as SRCCAP (HO-1), falls under this category. All these corridor approach projects combined will enhance each other in developing the study area as the production center of vegetables with economies of scale, and through generating strong synergy with road and distribution networks. Another newly proposed project in the vegetables subsector, i.e., non-conventional irrigation (HO-3), has also synergistic relationship with HO-1 in the production aspect.
- In the livestock subsector, SRCTLPS (LI-1) has synergistic relationships with both HO-1 in terms of risk alleviation of farm economy that will endeavor on vegetable production and road networks in terms of milk collection network.
- In the fruits subsector, a newly proposed project which will address the production aspect of Junar (HO-2) is expected to generate multiple synergies with other ongoing projects. Combined together, they will take advantage of the road and distribution networks.
- Other newly proposed projects, i.e., breed improvement projects (LI-2 and LI-3) in the livestock subsector and the NTFP study (HO-6) have no direct synergistic relationships with road and distribution networks improvement.

By looking into the synergy aspect of the newly proposed projects as against road network improvement, among them, and with other ongoing projects, their strategic importance has surfaced. Table 8.3 below presents the summary of the strategic importance of the newly proposed projects.

Table 8.3: Strategic Importance of Newly Proposed Projects in terms of Synergies

#	Code	Project Name	Strategic Importance in terms of Synergy Aspect	Expected Level of Synergy
1	HO-1	Sindhuli Road Corridor Commercial Agriculture Promotion (SRCCAP)	This project has multiple synergistic relations. Among them, the most important is the synergy with road and distribution networks. Other synergies combined together are assumed to generate substantial social and economic impacts in the corridor.	High
2	HO-2	Strengthening of Junar Production System	Improvement of the production aspect of Junar has direct synergies with other ongoing projects concerning Junar. This project, if rightly designed with GO-2, will generate long-lasting synergies with relatively small inputs.	High
3	HO-3	Non-conventional Irrigation	This project can enhance the outcome of HO-1 when aligned together.	Medium
4	HO-4	Kurkhot Logistics Center and Associated Distribution Network	Because of Kurkhot's strategic location at the crossroad of the four directions that connect major consumption markets and emerging production areas, it has a high potential to grow as an important transit/forwarding point that can generate substantial social and economic impacts in a large public area. This is worth investigating in order to achieve productive use of road network through synergy.	High
5	HO-5	New Vegetables/Fruits Wholesale Market in Eastern Kathmandu	The necessity of this project is already endorsed by GON and it is expected to serve as the eastern gate of horticulture products into Kathmandu Valley. Realization of this project may possibly trigger the innovation of distribution system in the capital area if designed correctly.	High
6	HO-6	Study for NTFP Promotion	Although seeking for the possibility to improve the welfare of people residing in non-accessible areas is important, this project is rather isolated in terms of synergy with other projects, especially with road networks.	Low
7	LI-1	Sindhuli Road Corridor Traditional Livestock Production Strengthening (SRCTLPS)	This project is the offspring of the pilot projects under the Study. It has synergistic relations with HO-1 in the aspect of farm economy resilience, i.e., constant income from dairy and substantial income from goat in time of emergency. Moreover, the day-to-day activities of farmers, e.g., milk collection at the collection center (CC), function to sustain and enhance the activities of the CC, which is also the focal point in the HO-1 activity.	High
8	LI-2	Genetic Improvement and Breeding of Dairy Animals	This project is important because once it has been successfully done, it will produce long lasting benefits for the populace. However, in terms of synergies with other projects including the road networks, its importance is low. This project is expected to be carried out with a well thought-out preparation in connection with the national system and should be carried out as a long-term project.	Low
9	LI-3	Genetic Improvement and Breeding of Goats	Same as above.	Low
10	LI-4	Consignment Mating of Dry Buffaloes for Milk Production and Genetic Improvement – Pilot	This project is worth implementing as it has been proven feasible in other parts of South Asia. However, in terms of synergy with other projects including the road networks, its importance is low.	Low

Source: Study Team

Based on the discussions above, the Study proposes to prioritize five newly proposed projects judged to generate high level of synergies, i.e., HO-1, HO-2, HO-4, HO-5, and LI-1.

8.3.3 Proposed Implementation Schedule

Based on the discussions above, the proposed implementation schedules of the long-listed projects are presented in Figure 8.2. As a matter of course, the proposed implementation schedules only apply to the newly proposed projects and they are only indicative. Meanwhile, the schedules for the ongoing projects (including those currently in the pipeline) are drawn based on their actual schedules.

#	Code	Project Name	Implementation by	Stage	Full Completion of Sindhuli Road													
					Year													
					2014		2015		2016		2017		2018		2019		2020	
1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2			
Newly Proposed Projects in SRCCAMP	1	HO-1	Sindhuli Road Corridor Commercial Agriculture Promotion Project (SRCCAP)	DOA	New (TA)													
	2	HO-2	Strengthening of Junar Production System	DOA	New (TA)													
	3	HO-3	Non-conventional Irrigation	DOA, DOLIDAR	New (FS-GR)													
	4	HO-4	Kurkot Logistics Center and Associated Distribution Network	DOA (DABPMD)	New (FS-GR)													
	5	HO-5	New Vegetables/Fruits Wholesale Market in Eastern Kathmandu	DOA (DABPMD)	New (FS/BD-D/D-GR)													
	6	HO-6	Study for NTFP Promotion	MoFSC	New (ST)													
	7	LI-1	Sindhuli Road Corridor Traditional Livestock Production Strengthening (SRCTLPS)	DLS	New (TA)													
	8	LI-2	Genetic Improvement and Breeding of Dairy Animals	DLS	New (TA)													
	9	LI-3	Genetic Improvement and Breeding of Goats	DLS	New (TA)													
	10	LI-4	Consignment Mating of Dry Buffaloes for Milk Production and Genetic Improvement - Pilot	DLS	New (FS)													
Ongoing Government Projects	11	GO-1	Continuous Expansion of Agricultural Services by DADO	DOA (DADO)	Ongoing Under Planning													
	12	GO-2	Continuous Expansion of Agricultural Services by DLDO	DLS (DLDO)	Ongoing Under Planning													
	13	GO-3	Strengthening of the Functions of Agriculture and Livestock Development Centers in the Study Area	DOA, DLS	Ongoing Under Planning													
	14	GO-4	Establishment of Fruits Juice Processing Plant	DOA, FNCCI/AEC, Junar Central Coop., Producer Groups/Coops.	Ongoing													
	15	GO-5	One District One Product (ODOP) Program	DOA, FNCCI/AEC, Central & District Level ODOP Committees	Ongoing													
	16	GO-6	Road Network Improvements (3 bridges across major rivers by DOR, rural roads based on DTMPs 2014-2018)	DOR, DOLIDAR, DDC, VDC	Ongoing													
	17	GO-7	Special Economic Zone Project (SEZP), Panchkhar, Kavre District	MOI	Ongoing													
Donor Supported Projects Ongoing or Under Planning	18	DN-1	High Mountain Agribusiness and Livelihoods Improvement Project (HIMALI) (Dolakha)	DOA, ADB	Ongoing (LN+TA)													
	19	DN-2	Community-Managed Irrigated Agriculture Project (CMIASP) (Support for FMIS)	DOI, ADB	Ongoing (LN)													
	20	DN-3	Roads Connectivity Sector I (incl. bridge across Sunkoshi River at Kurkot)	DOR, ADB	Ongoing (LN)													
	21	DN-4	Project for Agriculture Commercialization and Trade (PACT)	DOA, WB	Ongoing expand in 2014 (LN+TA)													
	22	DN-5	Poverty Alleviation Fund Project II (Small Irrigation Development in 4 districts)	WB, IFAD	Ongoing (LN)													
	23	DN-6	Leasehold Forestry and Livestock Programme (LFLP)	MOFSC, DOF, DOL	Ongoing													
	24	DN-7	Rural and Agricultural Development Project in Ramechhap District	DOA, SDC	Under Planning (TA)													
	25	DN-8	Vegetable Seed Project in Ramechhap, Phase 3	DOA, SDC	Ongoing													
	26	DN-9	Income Generation Programme under "Girls Power Project"	Plan Nepal	Ongoing													
	27	DN-10	Volunteer Programs (JOCV, SV)	JICA	Ongoing													
	28	DN-11	Project for Establishing Sustainable Production and Supply System for High Value Agricultural Crops in the Hilly Areas of Sindhuli District	GLMI, local NGO	Ongoing (TA)													
	29	DN-12	UNNATI	EU, CARE Nepal, CEAPRED	Ongoing (TA)													
	30	DN-13	Market Information Improvement (within the framework of RISMF)	ADB, FNCCI/AEC	Ongoing													



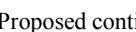
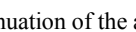

 Proposed schedule
 
 Proposed continuation of the activities as government's routine program
 
 Ongoing projects
 
 Ongoing program

Figure 8.2: Proposed Implementation Schedule of Newly Proposed Projects (with Ongoing Projects) in the Order of the Long List

8.4 Strategic Environmental Assessment (SEA)

The Study conducted SEA on the ten newly proposed projects in the long list by treating them as one integrated set, according to the general SEA method. As a result, all newly proposed projects were evaluated to have no serious social and environmental impacts, with the condition that projects that are subject for Initial Environmental Examination (IEE) and Environmental Impact Assessment (EIA) under the current regulation in Nepal should take appropriate procedures.

9. ACTION PLAN

9.1 A/P for Five Prioritized Projects

The proposed implementation schedules of the five prioritized projects are extracted from the schedules of the long-listed projects discussed in the previous chapter, as presented in Figure 9.1 below.

#	Code	Project Name	Implementation by	Stage	Full Completion of Sindhuli Road													
					Year													
					2014		2015		2016		2017		2018		2019		2020	
1	2	1	2	1	2	1	2	1	2	1	2	1	2					
1	HO-1	Sindhuli Road Corridor Commercial Agriculture Promotion Project (SRCCAP)	DOA	New (TA)	[Gantt chart showing implementation from 2014 to 2020]													
2	HO-2	Strengthening of Junar Production System	DOA	New (TA)	[Gantt chart showing implementation from 2014 to 2020]													
3	HO-4	Kurkhot Logistics Center and Associated Distribution Network	MOAD	New (FS-GR)	[Gantt chart showing implementation from 2015 to 2020]													
4	HO-5	New Vegetables/Fruits Wholesale Market in Eastern Kathmandu	MOAD	New (FS/BD-D/D-GR)	[Gantt chart showing implementation from 2014 to 2020]													
5	LI-1	Sindhuli Road Corridor Traditional Livestock Production Strengthening (SRCTLPS)	DLS	New (TA)	[Gantt chart showing implementation from 2014 to 2020]													

Source: Study Team

Figure 9.1: Proposed Implementation Schedules for the Five Prioritized Projects

As indicated in the figure above, except for HO-4 which is interrelated with the completion of both Sindhuli Road and the bridge across the Sunkoshi River in Kurkhot anticipated in 2015, the prioritized projects are proposed to start in 2014. It should be noted that HO-5 is subject to site assurance by GON for implementation and the schedule is primarily dependent on this factor. The other three projects, i.e.: HO-1, HO-2, and LI-1, have been judged as appropriate for early implementation as the condition permits.

HO-1 and LI-1, which are both offspring of the SRCAMP pilot projects, are proposed as separate projects considering their independency in terms of implementation. They can be carried out without having the same window. In terms of synergy and complementarities, the two projects are interdependent and they are proposed to be implemented with certain coordination between them, i.e., in the same pockets in parallel or in a staggered manner. In case implementing them separately will be

difficult, LI-1 should be included in HO-1 as one of the latter's component.

9.2 A/P for Each Prioritized Project

The A/Ps for the five prioritized projects were prepared in the same format. It consists of the basic outline information of the projects as suggested by the Study Team.

Section 9.2 of the main text discusses the contents for each prioritized project.

10. CONCLUSION AND RECOMMENDATIONS

10.1 Conclusion

The proposed M/P has good grounds for its validity and applicability, and taking these into consideration, the Study Team has concluded that the proposed A/P should be implemented as early as possible. Grasping the opportunity to accelerate the emerging trend of agricultural commercialization will ascertain the status of the study area to grow as one of the major production centers of HVCs in Nepal.

10.2 Recommendations

The Study Team believes that through the implementation of the priority projects selected and proposed for the A/P, a relatively early realization of the outcomes, which are sustainable beyond 2020, can be expected. This is because they are prioritized based on their synergistic relationships mainly with road network improvements that are currently taking place with an effect that will remain for a long time, and because business-oriented activity which characterizes agricultural commercialization, once it properly took off, will sustain itself with the economic motives of the stakeholders combined with the multiplier effects of new entries.

Hence, the Study Team recommends the MOAD and concerned parties to implement the prioritized projects as proposed in the A/P by assuring the budget allocations internally as well as securing the support of donor agencies. A few additional recommendations that the Study Team would like to make are:

- (1) Agricultural commercialization naturally entails the risk inherent to market mechanisms and the prices of the commodities often fluctuate. Therefore, the measures to hedge such risks should be established in the intervention, e.g., to maintain the balance between vegetables and staple crop and/or livestock production as well as to control the pace of shifting towards HVCs: and
- (2) To promote agricultural commercialization in the study area, the MOAD is recommended to promote the policies and actions described in the policy matrix as well as in the BDS. In doing so, the major roles that public sector players are expected to perform are facilitations in various fronts in order to create a conducive environment and opportunities for farmers and private sector players to strengthen their ties, as was initiated and proposed in the Study.

**The Project for the Master Plan Study
on High Value Agriculture Extension and Promotion Project
in Sindhuli Road Corridor in Nepal
(SRCAMP)**

Final Report

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Appendixes

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Abbreviations and Acronyms

ABPMDD	: Agribusiness Promotion and Market Development Directorate
AD	: Anti-dumping
ADB	: Asian Development bank
ADS	: Agricultural Development Strategy
AEC	: Agri Enterprise Center
AFPDB	: Animal Feed Production and Distribution Board
AI	: Artificial Insemination
AICL	: Agricultural Inputs Company Ltd
ALI	: Agriculture Lime Industry
AMPMD	: Agriculture Business Promotion and Market Promotion Directorate
A/P	: Action Plan
APP	: Agriculture Perspective Plan
APP-ISR	: APP Implementation Status Report
APPSP	: APP Support Program
ASC	: Agricultural Service Center
BDS	: Basic Development Strategy
CADP	: Commercial Agriculture Development Project
CBOs	: Community-based Organizations
CBS	: Central Bureau of Statistics
CCTC	: Central Cooperative Training Center
CDB	: Commercial and Development Bank
CDC	: Cotton Development Committee
CG	: Chaudhary Group
C/P	: Counterpart
CRAD	: Central Regional Agricultural Directorate
CRDLS	: Central Regional Directorates of Livestock Services
CTEVT	: Council for Technical Education and Vocational Training
CVD	: Counter-veiling Duties
DADC	: District Agriculture Development Committee
DADO	: District Agriculture Development Office
DBDS	: Draft Basic Development Strategy
DCCI	: District Chamber of Commerce and Industry
DDC	: District Development Committee
DDCN	: Dairy Development Corporation
DFID	: Department for International Development
DFO	: District Forest Office
DFTQC	: Department of Food Technology and Quality Control

DFUGs	: Community Forest User Groups
DLS	: Department of Livestock Services
DLSO	: District Livestock Service Office
DM	: Dry Matter
D-NGOs	: District-level NGOs
DOA	: Department of Agriculture
DOC	: Department of Cooperatives
DOF	: Department of Forest
DOI	: Department of Irrigation
DOLIDAR	: Department of Local Infrastructure and Agricultural Road
DOR	: Department of Road
DTMPs	: District Transport Master Plans
EC	: European Commission
FAO	: Food and Agriculture Organization
FCO	: Fertilizer Control Order
FFs	: Field Facilitators
FMIS	: Farmer Managed Irrigation System
FMSI	: Farmer Managed Small Irrigation
FNCCI	: Federation of Nepalese Chambers of Commerce and Industries
GDP	: Gross Domestic Product
GIS	: Geographic Information System
GOJ	: Government of Japan
GON	: Government of Nepal
HIMALI	: High Mountain Agribusiness and Livelihood Project
HPPC	: Herb Production and Processing Company
HVAP	: High Value Agriculture Project
HVC	: High Value Commodity
IASS	: Institute of Agriculture and Animal Science
ICT	: Information and Communication Technology
IFAD	: International Fund for Agricultural Development
IPM	: Integrated Pest Management
JICA	: Japan International Cooperation Agency
JT	: Junior Technician
JTA	: Junior Technical Assistant
LF	: Liver Fluke
LMPD	: Livestock Market Promotion Directorate
LSGA	: Local Self-Governance Act
MDGs	: Millennium Development Goals
MIS	: Micro Irrigation System

MLD	: Ministry of Local Government
MOAD	: Ministry of Agriculture Development
MOFALD	: Ministry of Federal Affairs and Local Development
MOFSC	: Ministry of Forest and Soil Conservation
MOI	: Ministry of Industry
M/P	: Master Plan
MWR	: Ministry of Water Resources
MWUS	: Multiple Water Utilization System
NAES	: Nepal Agriculture Extension Strategy
NAP	: National Agriculture Policy
NARC	: Nepal Agriculture Research Council
NARDF	: National Agriculture Research and Development Fund
NARI	: National Agriculture Research Institute
NASRI	: National Animal Science Research Institute
NCDB	: National Cooperative Development Board
NDDB	: National Dairy Development Board
NDDP	: National Dairy Development Policy
NEAT	: Nepal Economic Agriculture and Trade
NFC	: Nepal Food Corporation
NGO	: Non-Governmental Organization
NLSS	: Nepal Living Standard Survey
N-NGOs	: National-level NGOs
NPC	: National Planning Commission
NRB	: Nepal Rastra Bank
NSCL	: National Seeds Company Ltd.
NTCDB	: National Tea and Coffee Development Board
NTFPs	: Non-Timber Forest Products
OJT	: On the Job Training
ODOP	: One District One Product
OVOP	: One Village One Product
PACT	: Project for Agricultural commercialization and Trade
PPP	: Public-Private Partnership
PPS	: Pocket Package Strategy
RAD	: Regional Agriculture Directorates
RDLS	: Regional Directorates of Livestock Services
RISMF	: Raising Incomes of Small and Medium Farmers Project
SCC	: Saving and Credit Cooperative
SC	: Service Center
SDC	: Swiss Development Cooperation

SEA	: Strategic Environmental Assessment
SPS	: Sanitary and Phyto-Sanitary Measures
SRC	: Sindhuli Road Corridor
SRCAMP	: The Project for the Master Plan Study on High Value Agriculture Extension and Promotion in Sindhuli Road Corridor
SRCCAP	: Sindhuli Road Corridor Commercial Agriculture Promotion
SRCYLPS	: Sindhuli Road Corridor Traditional Livestock Production Strengthening
SSC	: Sub-Service Center
TCN	: Timber Corporation of Nepal
TYP	: Three-year Plan
USAID	: United States Agency for International Development
VCA	: Value Chain Approach
VDC	: Village Development Committees
WB	: The World Bank
WUAs	: Water Users' Associations

Units and Currency

kg	kilogram
t, MT	Metric tonnes = 1,000 kg
qt	quintal (100 kilogram)
ropani	1 ropani=500m ²
mm	millimeter
cm	centimeter
m	meter
km	kilometer
ha	hectare
NRS, Rs.	Nepali Rupee
km ² , sq.km	square kilometer
m ³	cubic meter
ASL	Above Sea Level
MSL	Mean Sea Level
° C	degrees centigrade
%	percent
USD	United States of America Dollar

USD 1.0 = ¥ 102.25 = Rs. 98.13 (Rs. 1.0 = ¥ 1.042)

(as of March 1 2014)

¥ = Japanese Yen

Rs. = Nepali Rupee

**The Project for the Master Plan Study
on High Value Agriculture Extension and Promotion Project
in Sindhuli Road Corridor in Nepal
(SRCAMP)**

Final Report

PART I: BACKGROUNDS AND ANALYSIS OF CURRENT SITUATION

PREFACE

Part I of the draft final report Volume I of the Project for the Master Plan Study on High Value Agriculture Extension and Promotion in Sindhuli Road Corridor in Nepal (SRCAMP) (hereafter referred to as "Part I") was prepared in order to present an analysis of the current situation of agricultural commercialization in Nepal and the study area. It also includes the results of the pilot projects implemented in the study area to verify the Draft Basic Development Strategy (DBDS) which outlines future directions for agricultural commercialization. Information and analysis included in Part I were utilized as the foundation to prepare the Master Plan (M/P) that is presented in this report as Part II.

The first chapter of Part I is an introduction to the Study. Background information, objectives, activity scope, and the target area of the Study are explained in this chapter. It provides a quick overview of the Study and the Sindhuli Road Corridor (SRC) area.

The second chapter provides an overview of the agriculture sector in Nepal. It contains information regarding the agriculture sector in the entire country. It starts out by explaining the position and main challenges of the agriculture sector, and then provides an explanation of relevant government organizations, policies, and major programs followed by information on donor assistance. In the latter part of this chapter, factual information concerning Nepal's agricultural production, inputs, finance, trade, and demand is compiled from which the former part of the chapter is derived.

The third chapter presents factual information on agricultural development in the SRC districts. It includes district-level efforts for agricultural commercialization, such as development plans and programs of each District Agriculture Development Office (DADO) and District Livestock Service Office (DLSO), their organizations and resources. The challenges they have encountered are presented in this chapter. In addition, the production, post-harvest handling (marketing and distribution) as well as the key players concerning the agriculture sector, especially agricultural commercialization, are examined in this chapter.

The fourth chapter presents the potential commodities and value chain studies of these commodities

in the SRC area, main constraints for agricultural commercialization in the SRC area, and countermeasures for the constraints identified.

The value chain study was conducted on ten selected commodities, analyzing their current flow and added values in the chain, from input to consumption. Major constraints and points of interventions in the chain became clear. This information was utilized, combined with information in previous chapters, to identify the constraints and countermeasures identified.

The main constraints for agricultural commercialization in the SRC area revealed that the constraints for agricultural commercialization in the study area are of various in types and multi-layered. The Study identifies constraints in five major aspects: vegetable, fruit, milk, meat, and producer organizations. Although each aspect has its own constraints in both production and trading process, the major constraints for agricultural commercialization in Nepal are attributed to the weak linkage in the distribution systems associated with accessibility problems.

As for the countermeasures for the constraints identified, some new ideas are presented to address the recognized challenges. Countermeasures were considered for both production and post-harvest handling or distribution processes.

The fifth chapter summarizes DBDS and the results of the pilot projects. The DBDS provides recommendations aiming at promoting agricultural commercialization in the study area towards 2020. Five core strategies, together with five vegetables, three fruits, five livestock, and three producer organization strategies, were presented here. Further, the results of the pilot projects, which were implemented in the area for 19 months in order to verify these strategies, are also presented. The results and lessons obtained from the pilot project experiences revealed that the strategies included in DBDS were valid, and efforts should be continued for agricultural commercialization in the SRC area. The DBDS was revised based on the information given in Part I. Detailed analysis of this process is included in Part II.

CHAPTER 1 INTRODUCTION

1.1 Background

In Nepal, two-thirds of the population is engaged in agriculture sector, and the share of the agriculture sector in the gross domestic product (GDP) is about one-third. Most of the poor lives in the rural areas, with agriculture as their vital means of subsistence.

Nepal has different agricultural development approaches for the plain region and the hill and mountain area, which have different meteorological characteristics. While it is aimed to improve the productivity of staple foods such as rice and wheat by technical improvements in the plain region, high value commodities (HVCs) such as livestock products (mainly milk), fruit trees, and vegetables are promoted in the hill and mountain area. In the hill and mountain area, farming is practiced in small land plots on steep slopes. Moreover, the production of livestock products, fruits, and vegetables utilizing a variety of meteorological conditions and regional characteristics has higher potential than the production of staple foods. However, the infrastructure and institutions necessary for this approach, such as irrigation facilities and agricultural roads, agricultural technology and extension services, access to production inputs (fertilizers and seeds), and organization of farmers, have not been sufficiently developed in the area.

The four study districts in SRC, namely, Kavrepalanchowk (hereafter referred to as Kavre), Dolakha, Ramechhap, and Sindhuli, are situated in the hill and mountain areas in the eastern part of Nepal. They were the bases of the Maoists movement during the ten-year domestic conflict from 1996 to 2006, and categorized as the underdeveloped and poor area. These districts are located along the shortest route in transporting agricultural products or daily commodities from Terai Plain and India to Kathmandu. However, since the existing road passing through these districts was narrow and inadequate, people opted to use Prithvi Highway which goes around over 200 km to the southwest area. Prithvi Highway is also facing some problems such as high risk to heavy rains and mud slides that cause traffic to shut down as well as the long detour from eastern Terai Plain. The Government of Nepal (GON) planned to construct the Sindhuli Road as the second highway connecting Kathmandu basin to Terai Plain, and requested the Government of Japan (GOJ) for assistance in the construction. Responding to the request, GOJ started the construction plan of the Sindhuli Road through a grant in 1996, and the entire route of around 160 km is expected to be fully opened in 2015.

In the districts located along the Sindhuli Road, which is currently under construction, it is expected that the opening of the road would bring about secondary effects, including economic revitalization of the underdeveloped areas and improvement of livelihood. In order to prepare for the expected changes due to the opening of Sindhuli Road, GON with the technical assistance of the Japan International Cooperation Agency (JICA), launched the SRCAMP in June 2011 and implemented for approximately three years.

1.2 Objectives and Scope of the Study

The overall goal of the Study is to contribute to the livelihood improvement of the rural population in the SRC area through income generation by enhanced high value commercial agricultural production. The objective of the Study is to formulate the medium- to long-term plan to promote HVCs and to transfer relevant skills/technologies to the Nepali counterpart (C/P) personnel through joint work on basic information exchange, formulation of the Basic Development Strategy (BDS), implementation of pilot projects, and formulation of the M/P with the Action Plan (A/P) and the Policy Matrix.

The Study consists of three phases as shown in Table 1.1. The work flow by output in each phase is described below.

Table 1.1: Main Activities and Period of Each Phase

Phase 1	Preparation of BDS based on the collected basic information, selection of target agricultural products, and zoning.	May 2011-March 2012 (11 months)
Phase 2	Examination of effectiveness of draft development scenario with the implementation of pilot projects by zone.	May 2012-October 2013 (18 months)
Phase 3	Formulation of M/P.	April 2013-March 2014 (1 year)

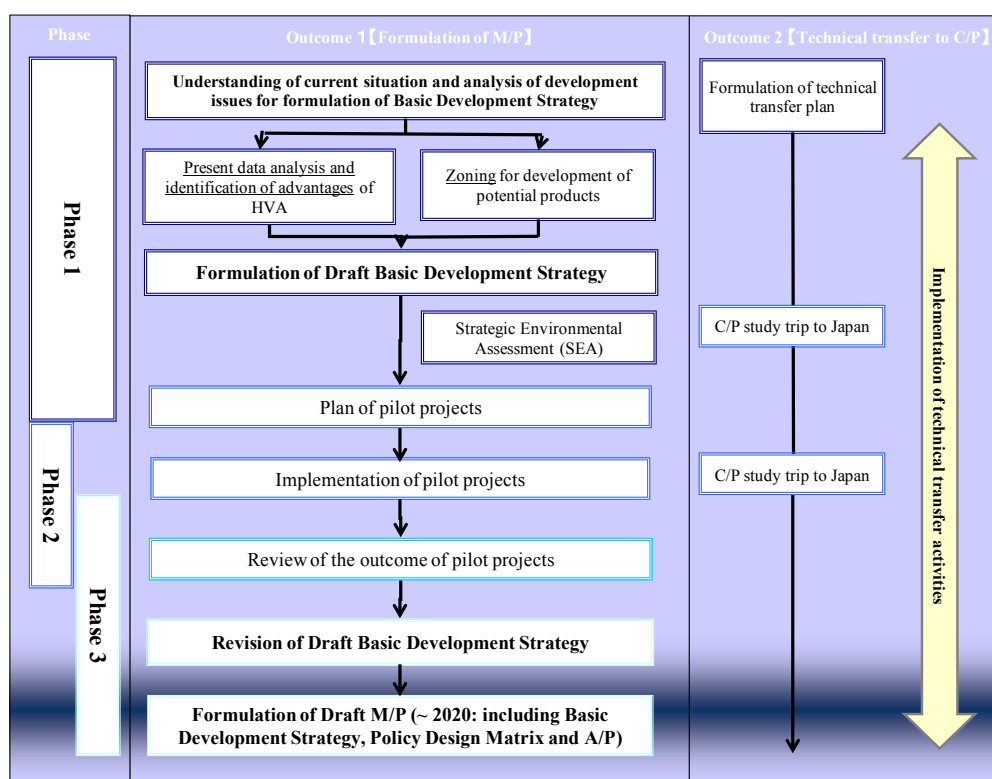


Figure 1.1: Work Flow by Outcomes in Each Phase

1.3 Study Area

The study area covers the four districts in SRC area, namely, Kavre, Dolakha, Ramechhap, and Sindhuli districts.

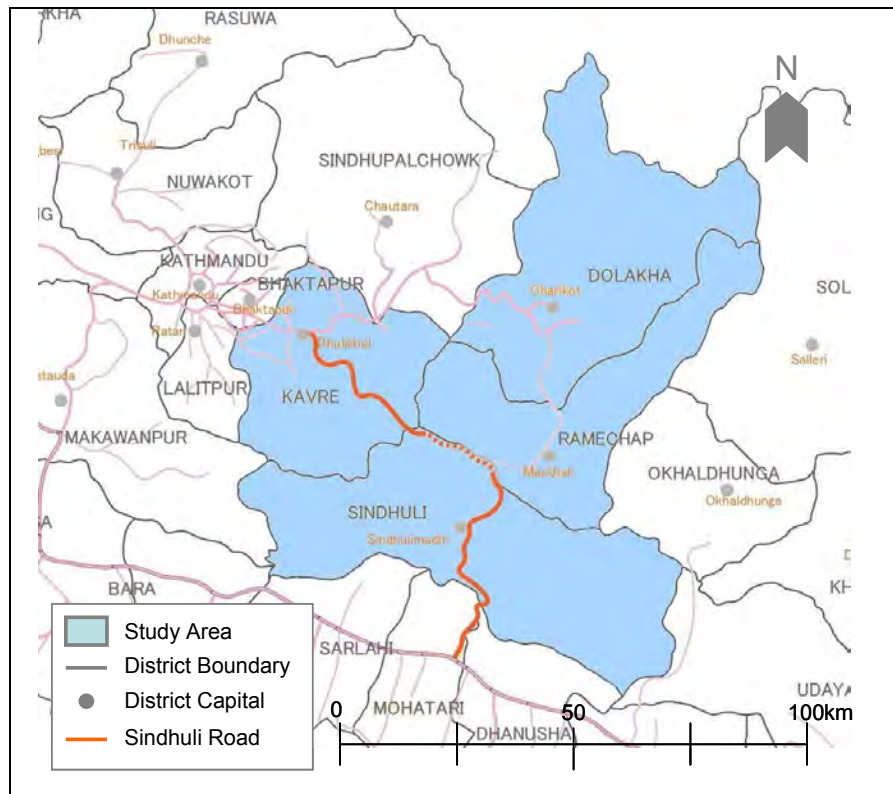


Figure 1.2: Location of Four Districts of the Study Area

The study area is geographically and meteorologically diverse, i.e., the difference in elevation is approximately 6,900 m, ranging from 7,183 m in Dolakha District to 305 m in Sindhuli District. Likewise, precipitation and temperature vary within the area. The variety of natural conditions in the area makes it possible to grow various crops, and also allows the production of off-season vegetables in the plains.

It is expected that the regional distribution conditions will significantly be improved by the opening of the Sindhuli Road and development of associated road networks in the area. It is, therefore, necessary that the Study not only ensures to seek for ways to fully grasp this opportunity but also to consider the balanced distribution of the development benefits within the study area.

CHAPTER 2 OVERVIEW OF AGRICULTURE SECTOR IN NEPAL

2.1 Status of Agriculture in Nepal

In Nepal, agriculture is the key sector in ensuring food and nutritional security, sustainable development, and alleviation of poverty. The economy of Nepal is mainly based on agricultural production. The industrial base is small, and commodities from the agriculture sector dominate production. About 90% of the population lives in the rural areas whose key occupation is agriculture. In 2012/13, agriculture and forestry sector provided 28.3% of the total GDP¹. While the growth in this sector is crucial to reduce poverty and foster inclusive development, annual growth of agriculture sector in GDP at constant price has, however, been unstable.

Table 2.1: Annual Growth of Agriculture and Non-agricultural Sector GDP

(Unit: Percent)

Sector	2006/07	2007/08	2008/09	2009/10	2010/11	2011/12	2012/13
Agriculture, forestry and fishing	0.97	5.82	3.02	2.01	4.51	4.98	1.26
Non-agriculture	4.36	5.88	4.14	5.39	3.64	4.15	4.98

Source: Central Bureau of Statistics (CBS) 2013 a. National Accounts of Nepal, Kathmandu, Nepal

The growth of agriculture sector has not only been erratic but also weak and insufficient to make a major impact on poverty reduction. The average growth rate of agriculture sector has been 1.3% in 2012/13 while it was 3% in 2001/02². Although there is a decline in the incidence of poverty³ in the rural areas, where most of the poor live, from 43% to 29% between 1995/96 and 2009/10, it is still high as compared to the decline in the urban area, from 22% to 7% during the same period⁴.

The income level in Nepal, particularly those engaged in agriculture is very low by international standards. The Preliminary Nepal Living Standard Survey (NLSS) Report 2011/12 showed that the share of agriculture to the wage employment is about 35%⁵. With a nominal per capita GDP estimated at USD 717 in 2012/13, Nepal is among the poorest countries in the world. Agriculture will need to play a substantial role to lower the poverty to 21% by 2015 so as to achieve the Millennium Development Goals' (MDGs) target on poverty reduction.

In addition, the portion of agriculture sector in total GDP has declined in recent years. The share of agriculture in GDP in 1990 was 49% but has declined to 28% in 20 years. Nevertheless, the role of agriculture still remains prominent, with around 74% of labor force, aged 15 years and above who are currently economically active, are employed in this sector⁶.

Although the share of agriculture in gross GDP has been declining, it is still the largest single sector of

¹ CBS 2013 a

² CBS, 2013 a

³ The national poverty line in Nepal is calculated as the value of a food basket of 2,200 calories plus some very basic non-food items. According to the preliminary result of NLSS III based on current market prices, a person needs an income of at least Rs. 14,430 per year to manage food items equivalent to 2,200 calories per day and other essential non-food items.

⁴ CBS, 2011 d

⁵ CBS, 2011 b

⁶ CBS, 2009

the economy. Besides being a major source of food and employment, this sector is also vital for the growth and development of the industrial and export sectors as both of these sectors are agriculture-based. But Nepal's trade in general and food in particular is highly imbalanced⁷ with food trade deficit in 2007 estimated at 34.1% of total food trade. Further, the food trade to agriculture GDP ratio which stands at 17% is significantly lower as compared to the country's merchandise trade to GDP ratio which stands at 42%.

Nepal's agriculture sector, where a large number of people depend on for their livelihood, needs modernization and commercialization for better growth and poverty reduction.

2.2 Main Challenge of Agricultural Sector in Nepal

The main challenge of the agriculture sector in Nepal is ensuring the compatibility of food security and agricultural commercialization. Due to the low productivity of traditional crops i.e., mainly minor grains in the hill and mountain areas, the shifting of production to horticultural crops such as vegetables and fruits utilizing the regional meteorological conditions is recommended. Therefore, **the concept of agricultural commercialization in Nepal should be recognized not as commercialization with high-level processing such as agricultural mechanization or mass production, but as a measure to exit from low-level, subsistence agriculture.**⁸ Since the Agriculture Perspective Plan (APP) was adopted in 1997 as a guideline for the development of agriculture sector for the next 20 years, all the development plans, including the "Three-year Plan (2010/11~2012/13)" are based on APP, with continuous emphasis on high value agriculture, food security, and agricultural commercialization.

On the other hand, APP is facing various issues on its progress. In this regard, the most important point is the necessity of enhancing the effectiveness and reliability of the system of agriculture sector as a whole to promote commercialization. In order for small farmers to convert subsistence crops to high value crops, there is a need to reduce crop acreage by increasing productivity, and ensure the area for high value crops instead. It is also indispensable not only to introduce production input and technologies to grow high value crops, but also to establish an effective and reliable marketing system to get products encashed. GON has expressed its intention to make continuous efforts in the agriculture sector in response to the estimated growth of demands on high value agricultural products based on population and income growth in urban areas, as well as, the economic growth in India. In this regard, this Study shall be implemented in line with and to pursue these efforts.

2.3 Government Policies

2.3.1 Agriculture Policy, Acts, Rules, and Regulations

In Nepal, the 20-year APP is in operation since 1997 to accelerate agricultural growth for poverty

⁷ Bajracharya, B. 2008, International Trade. A paper submitted to Food and Agriculture Organization, Regional Office for Asia and the Pacific, Bangkok, Support for Inclusion of Food Security (SIFS) Objectives, Policies, Programs and Monitoring Mechanisms in the Poverty Reduction Strategy Paper (PRSP)/Interim (three years) Plan of Nepal, Thematic Report Series.

⁸ This definition of agricultural commercialization is consistently adopted throughout in this study from the beginning up to the end. Further elaborations will be made at the beginning of Chapter 7.

reduction in a sustainable manner. Since 1997, Nepal's agriculture sector has been directed by this long-term plan. This plan provides a framework for the medium- and short-term plans, including the Ninth Plan (1997/98–2002/03), Tenth Plan (2002/03–2006/07), Three-Year Interim Plan (2007/08–2009/10), Three Year-Plan (2010/11–2012/13), and Thirteenth Three-Year Plan Approach Paper (2013/14–2015/2016).

(1) Agriculture Perspective Plan : 1996-2015

APP was formulated by GON in 1995 for a 20-year plan, with support of the Asian Development Bank (ADB) and other donor agencies. The APP is designed to increase the per capita agricultural growth by six-fold from the base year of 1995 level of 0.5% to 3% per year. APP assumes that this growth would stimulate non-agricultural growth in employment-intensive goods and services sector throughout the country. If implemented in its entirety, this plan would reduce the incidence of poverty from 49% in 1991/92 to 14% in 2014/15. Without APP, the corresponding figure in 2014/15 would be 29%. With a view to achieve this aim, APP has set out the following inter-related objectives:

- Accelerate the growth rate in agriculture through increased factor productivity.
- Alleviate poverty and achieve significant improvement in the standard of living through accelerated growth and expanded employment opportunities.
- Transform the subsistence-based agriculture into a commercial one through diversification and widespread realization of comparative advantage.
- Expand opportunities for an overall economic transformation by fulfilling the precondition of agricultural development.
- Identify immediate-, short- and long-term strategies for implementation, and to provide clear guidelines for preparing periodic plans and programs in the future.

APP is the core of the sector strategy. The APP envisages diversification and commercialization of agriculture by raising cereal production in Terai and the output of fruits, high value crops including non-timber forest products (NTFPs), and livestock in the hill and mountain areas. These are to be achieved by managing four key inputs; 1) controlled year-round irrigation; 2) eased fertilizer supply; 3) need-based research and extension; and 4) linkage of potential production pockets with markets through rural agricultural roads and expansion of rural electrification. It is still relevant today and will remain so in the near future. Critics commented on its service delivery approaches, modalities, inadequate pro-poor orientation, private sector's inadequate support, and moreover government's failure to generate resources (particularly financial) for it⁹.

The APP Implementation Status Report (APP-ISR) prepared by APP Support Program (APPSP) reported the performance of priority outputs (livestock, high value commodities, agribusiness, and forestry) relatively better, whereas that of priority inputs (fertilizer, irrigation, technology, agricultural roads, and rural electrification) dismally poor. Nevertheless, the current Three-Year Plan (TYP)

⁹ APP Implementation Status Report, APPSP/DFID, June 2007.

reiterated an effective implementation and its adaption to changed situations.

(2) National Agriculture Policy 2004 (NAP)

Lacking the overall national policy on agriculture and the need to adapt APP to changed situations and respond to people's increased expectations through agriculture, GON promulgated NAP in 2004. Central to NAP is making agriculture dynamic and profitable to help reduce rural poverty. Focused on effective implementation of APP, it has set the following three objectives for agriculture sector:

- Increase agricultural production and productivity.
- Make Nepalese agriculture competitive with the regional and international markets by developing bases of commercial and competitive agricultural systems.
- Conserve, promote, and utilize natural resources, the environment, and bio-diversities properly.

One of the key features of this policy is that it commits to provide subsidies and support to the marginal and small farmers who own less than 0.5 ha of land. The policy is committed to provide tax write-off facilities to those private and non-government organizations when they spend on agricultural research and development.

(3) Thirteenth Three Year Plan Approach Paper: 2013/14 - 2016/17

In the Thirteenth Three-Year Plan (2013/14 to 2016), agricultural productivity enhancement and diversification and commercialization were identified as the second most priority areas to achieve its vision to move Nepal from least developed country to developing country by 2022. The plan intends to achieve an annual agricultural growth rate of 4.5% by improving access to irrigation facilities, agricultural roads, agricultural credit, agricultural extension and technology development, market infrastructure development, and promotion of private sector participation and investment on agricultural commercialization.

The key objectives of agriculture sector in the Thirteenth Three-Year Plan Approach Paper include:

- Increase production and productivity on agricultural and livestock products.
- Enhance competitiveness and commercialization of agricultural and livestock products.
- Develop and disseminate environment friendly technologies to reduce the negative effects or impacts of climate change.
- Conserve, manage, and sustainably use agro-biodiversity.

The following strategies have been proposed to fulfill the objectives of agriculture sector:

- Ensure food security by increasing agricultural and livestock production through agricultural commercialization, diversification, quality enhancement, rural infrastructure development, and mechanism.
- Develop competitive agricultural and livestock production by reducing production cost.
- Develop and implement quality standards to make agricultural and livestock production

competitive in the international market.

- Develop value added processing-based agricultural and livestock industry for production of high value and low volume agricultural commodities in feasible and appropriate areas.
- Promote agricultural marketing by effectively increasing the access of local people in quality testing, processing, monitoring, and regulating.
- Generate and disseminate research-based environment friendly technologies to minimize the negative effect of climate change through conservation, rejuvenation, and utilization of agro-biodiversity.
- Attract the youth in commercial agriculture by developing agriculture into respected and attractive profession.
- Transfer result-oriented implementation approaches in dissemination of technologies generated by research through inter-institutional coordination and cooperation among government, non-government, and educational institutions.

(4) Agricultural Development Strategy (ADS) : Currently Under Preparation

In view of the termination of the 20-year APP period and to prepare for the promulgation of the long-term plan for the next 20 years for Nepal's agriculture sector after APP, ADB and several other donors have been assisting the government to prepare the ADS with a view to increase the agriculture sector output that is more resilient to climate change. The preparation of ADS started in March 2011, aiming to complete it in 2012. Since then, several documents including the Vision Report and Policy Options Report have been prepared, and local and central level inception workshops and consultations were conducted. However, ADS has not been finalized at the time of writing this report.

According to the Policy Options Paper of ADS, the pillars of the new strategy will be:

- Food security, productivity, connectivity, and resilience;
- Sustainable production and resource management through climate change mitigation and adaptation, improved land and water management, and water resource allocation; and
- Increased private sector development, delivering fair reward to all value chain stakeholders.

As for agricultural commercialization, the policy goal is to transform the agriculture sector from subsistence level to a sector in which a vast majority of farming is carried out for commercial purposes and connected to the local and national economies and markets. This more commercialized agriculture requires a set of measures that focuses not only on farmers but also on agro-enterprises. In order to attain the goal, the following recommendations are given, encompassing the important areas to be addressed for promotion of agricultural commercialization.

Table 2.2: ADS Recommendation for Agricultural Commercialization

No.	Area	Recommendation
1	Investment Climate	Improve investment climate for agricultural commercialization through structured dialogues of the government with farmer organizations, trade organizations, cooperatives, and other private sector organizations.
2	Contracts	Strengthen contractual arrangements to promote agricultural commercialization through promotion of contract farming, land leasing, equipment leasing, and secured transactions for warehouse receipts.
3	Taxes	Develop tax policy supportive of an efficient commercial agricultural sector with the long term objective of agricultural sector providing the government with an additional source of revenues.
4	Finance	Promote development of diverse agricultural finance providers that supply a variety of competitive and demand-driven financial products.
5	Value Chains	Prioritize the development of competitive agricultural value chains that increase value added and benefits to smallholder farmers.
6	Roads	Continue the development of rural roads and accelerate the expansion of the network of agricultural roads.
7	Market Intelligence	Strengthen and rationalize existing systems of agricultural market information and establish new suites of information and communication technology (ICT) products for market intelligence.
8	Rural Electrification	Support expansion of rural electrification programs through the promotion of renewable energies (water, solar, wind, biomass, biogas).

Source: ADS Policy Options Paper, 2012

(5) Agriculture Sub-Sectors Policies and Acts

Apart from above umbrella policies, GON has promulgated other subsector policies in the agriculture sector as listed below. Most of these policies confirmed government's market-oriented economic policies, promotion of PPP institutional pluralisms, withdrawal of government's direct support in terms of subsidies and grant, and recognition to the role and importance of non-government organizations (NGOs) and community-based organizations (CBOs) in the development processes. Below is a list of other subsector policies and strategies. The brief descriptions are provided in Volume II SN1.1.

- 1) National Seeds Policy, 2000
- 2) National Tea Policy, 2000
- 3) National Fertilizer Policy, 2002
- 4) Irrigation Policy, 2003
- 5) National Coffee Policy, 2003
- 6) Agro-biodiversity Policy, 2004
- 7) Agribusiness Promotion Policy, 2006
- 8) National Dairy Development Policy (NDDP), 2007
- 9) Nepal Agriculture Extension Strategy (NAES), 2007

- 10) Revised Policy on Fertilizer Subsidy, 2009
- 11) Floriculture Promotion Policy, 2012
- 12) Rangeland Policy, 2012
- 13) Cooperative Policy, 2012
- 14) National Seed Vision (SDV), 2013

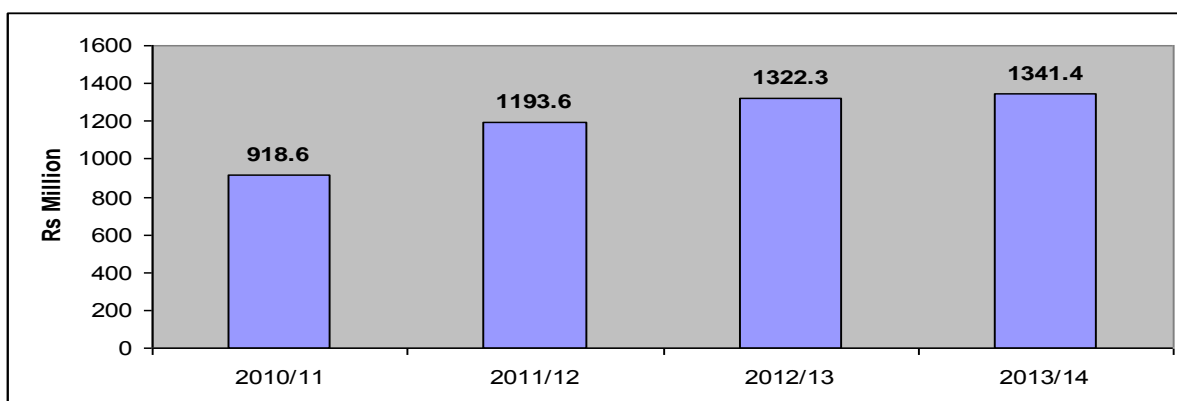
Other acts, rules, and legislations that focus on specific problems and constraints in agricultural development are listed in Volume II (SN 1.2 and 1.3).

2.4 Programs and Projects in Line with Policies

2.4.1 Government Commitment

Figure 2.1 presents the investment plan of the government in agriculture sector. The figure shows that government plans to significantly increase its investment in the agriculture sector, i.e., from Rs.918.6 million in 2010/11 to Rs.1,341.4 million in 2013/14.

In 2011/12, the government approved Rs.1,193.6 million of which about 75% (Rs.898.4 million) was provided by the government while the remaining 25% (Rs.295.2 million) was committed through donor assistance.



Source: National Planning Commission (NPC) 2011 b.

Figure 2.1: Investment Plan of GON in Agriculture Sector

2.4.2 Pocket Package Strategy (PPS)

The PPS guidelines approved by GON as part of the packages of strategies for implementation of APP provide mechanisms and processes for the identification of production pocket areas. GON has given a high priority to horticultural crops and livestock as both are two priority outputs of APP. The criteria for the identification of production pocket areas are given in Table 2.3.

Table 2.3: Criteria for the Identification of Pocket Areas

#	Type	Criteria
1	Crop production including horticulture	<ul style="list-style-type: none"> ▪ Area with road access, availability of irrigation, and electricity (all the three elements) ▪ Area with availability of irrigation and road access (two elements except electricity) ▪ Area with irrigation facilities only ▪ Areas with road access only ▪ Other feasible sites (Traditional agricultural areas)
2	Livestock and livestock originated products	<ul style="list-style-type: none"> ▪ Area with road access and availability of electricity and feed / fodder ▪ Area with road access ▪ Other feasible sites (Traditional agricultural areas)

Source: PPS 1998.

Since 1998, both the Department of Agriculture (DOA) and the Department of Livestock Services (DLS) have used PPS as one of the main strategies for technology diffusion and agricultural extension service delivery. Table 2.4 below shows the status of PPS implementation in 2011/12 under DOA. PPS has covered 12.18% of the total cultivated land and 15.7% farming households. Table 2.4 also shows the average agriculture land coverage and beneficiary households (HHs) per pocket at 217.5 ha and 286 HHs, respectively.

Table 2.4: Pocket Area Coverage, 2011/2012

#	Descriptions	Total
1	Number of pockets	1,726
2	Area under pockets (Hectare, 000)	375.3
2.1	Basic pocket	95,483.2
2.2	Commercial oriented	109,547
2.3	Commercial	128,135.2
3	Number of beneficiary HHs	493,561
3.1	No of beneficiary HH per pocket	286
4	Average area per pocket (ha)	217.5

Source: Agriculture Extension Directorate, 2012

Information on characteristics and size of pocket areas of both horticulture and livestock are summarized in Volume II (SN 2.1 Table 1.3 to 1.6). District level information about the pocket strategy is described in Chapter 3.

2.4.3 One District One Product (ODOP) Program¹⁰

Detailed information is provided in Volume II SN1.5.

2.5 Key Donor Projects in Agriculture Sector

There are many projects that have been supported by various donor agencies for the improvement of rural livelihood in Nepal. The total disbursement amount of donor assistance to Nepal in 2011/12 was USD 1.04 billion. The disbursement for agriculture sector was USD 45.9 million, the sixth largest among all sectors.

¹⁰ This section is a recapitulation of 2009 report.

The major donors in the agriculture-related field (including livestock) in Nepal are ADB, the World Bank (WB), and the International Fund for Agricultural Development (IFAD). The Food and Agriculture Organization (FAO) also provides various types of technical assistance. According to the Development Cooperation Report 2011-2012 of the Ministry of Finance, ADB is the largest donor, committing USD 78 million in agriculture sector, followed by the World Bank Group giving USD 62 million, and the UN systems handing over USD 17 million. As for the bilateral donors, the United States Agency for International Development (USAID) is the largest (the fourth from all donors), having committed USD 16 million, followed by Switzerland of USD 14 million and European Union (EU) of USD 13 million. Japan comes seventh entrusting USD 3 million. Bilateral donors' assistance has played an important role in rural and agricultural development although the total amount is smaller compared to the multilateral donors.

For agricultural commercialization, the approach that the multilateral donors take is to provide financial assistance (mostly matching grant or loan) to the value chain actors, based on the submitted proposals, in order to solve the constraints in the value chain. Also some rural infrastructure projects, supporting Farmer Managed Small Irrigation (FMSI) schemes and rural access roads, are implemented. For the implementation, independent project management unit is usually established, and some full-time management personnel are secured on secondment basis from the Ministry of Agriculture Development (MOAD) or relevant government agencies. Other team members and consultants are employed, of which expenses are included in the project cost. This system ensures the successful implementation of the project even with a limited extension capacity of the government.

Bilateral donor assistance for agricultural commercialization is also built around the value chain actors: supporting farmers for better production, strengthening linkage between production and market, creating market information flow for better transactions, etc. In most of the cases, bilateral projects are implemented through cooperation with the local NGOs and CBOs, sometimes by more than one, depending on the number and nature of the components of the projects.

The key donor funded projects in recent years are listed in Table 2.5 below. The details of some of the projects are provided as the project description sheets in Appendix 2 and in Volume II SN1.6.

Table 2.5: Key Donor Projects in the Agricultural Sector

Donor	Project Title
ADB	Decentralized Rural Infrastructure and Livelihoods (2004-2011)
	Community-Managed Irrigated Agricultural Sector (2004-2012)
	Commercial Agriculture Development Project (CADP) (2006-2013)
	Improving the Livelihoods of Poor Farmers and Disadvantaged Groups in the Eastern Development Region (2006-2010)
	Rural Reconstruction and Rehabilitation Sector Development Project (2008-2011)
	Highland Mountain Agribusiness and Livelihood Improvement Project (HIMALI) (2011-2017)
	Project for Raising Incomes of Small and Medium Farmers (2011-2017)
	Community Livestock Development Project (CLDP) (2003-2010)
WB	Irrigation and Water Resources Management (2007-2013)
	Nepal Food Crisis Response Program (2008-2011)
	Road Access Improvement and Decentralization Project (2005-2010)
	Poverty Alleviation Fund (PAF) II (2007 – 2012) (co-financed with IFAD)
	Project for Agricultural commercialization and Trade (PACT) (2009-2015)
	Nepal Agriculture and Food Security Project(2013 to 2018)
IFAD	Leasehold Forestry and Livestock Program (2005-2013)
	High Value Agriculture Project in the Hills and Mountains (HVAP) (2010-2017)
	Improved seeds for Farmers Program (2012-2019) (co-financed with Haifer International)
FAO	Improving National Carp Seed Production System in Nepal (2010-2012)
	Combating Citrus Decline Problems in Nepal (2010-2012)
European Commission (EC)	UNNATI – Inclusive Growth Program in Nepal (2013-2015)
Japan International Cooperation Agency (JICA)	Kennedy Round 2 Grant Program
	SRCAMP
	JOCV/SV Program
Swiss Development Cooperation (SDC)	Sustainable Soil Management Program Phase 4 (2011-2014)
	Coffee Promotion Project (2003 -)
	Home garden Project phase 3 (2009-2013)
	Local Infrastructure for Livelihood Improvement (LILI) Phase 2 (2009-2013)
	Vegetable Seed Project (VSP), Phase 3 (2011-2014)
	Agricultural commercialization Program (tentative name) (2015-2025)
USAID	Knowledge-based Integrated Sustainable Agriculture and Nutrition (KISAN) (2013-2018)
	Nepal Economic Agriculture and Trade (NEAT) (2010-2013)
	Global Agriculture and Food Security Program (GAFSP)
Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ)	Poverty Alleviation in Selected Rural Areas of Nepal (PASRA) (2005-2011)
	Inclusive Development of the Economy (INCLUDE) (2008-2012)
The Department for International Development (DFID)	Rural Access Program III (2012-2016)
	Nepal Market Development Program (SAMARTH-NMDP) (2012-2017)

2.6 Institutional Structure and Arrangement for Agricultural Development

2.6.1 Multiple Stakeholders

The institutional framework of agriculture sector consists of: 1) public sector institutions that are responsible for agricultural policy formulation, planning, implementation, agricultural research, and rural finance; 2) non-government sector including a large number of NGOs and CBOs that are engaged in a wide range of rural development and agricultural service delivery activities; and 3) private sector including mainly input suppliers, producers, processors, and traders.

Table 2.6 shows a list of institutions classified according to type and their role in agriculture sector.

Table 2.6: Agriculture Sector Institutions by Type and Function

Function/Type	Public Sector	Semi-Government	NGOs and Private Sector
Policy, coordination, formulation of legislations	<u>National</u> NPC, MOAD, MWR, MLD, <u>Local</u> DDC	<u>National</u> NDDB, NARC, NTCDB, NCDB,	FNCCI, AEC Commodity Associations
Program Implementation, Administration, Regulation	DOA, DLS, DOC, DFTQC, NARDF, <u>Local</u> DDC	NDDB, National Seeds Committee, NCDB, NARC	
Technology (Research & extension)	DOA, DLS, DFTQC, NARDF	NARI, NASRI, IAAS	INGOs, NGOs, Input suppliers
Training	DOA, DLS DOF, DOI, NCDTC	IAAS, CTEVT	INGOs, NGOs, Private training institutions
Irrigation	DOI, DDC, DADO		WUAs, Agriculture Cooperatives, INGOs, NGOs
Rural and agricultural road	DOLIDAR, DDC, VDC	-	INGOs, NGOs, CBOs private contractors
Rural Credit	NRB	Grameen Banks, CDB	Commercial Banks, Development Banks, INGOs, NGOs, Cooperatives, Grameen Banks
Input supplies	DOA, DLS, DOF	AICL, NSCL, ALI, AFPDB	Private sector (agro-vets, commercial suppliers)
Production		CDC	Private sector – small, medium and large scale
Processing	ABPMDB	DDCN, CDC, TCN, HPPC	Private sector – small, medium and large scale
Marketing outputs		NFC	Private sector (small, medium and large scale)

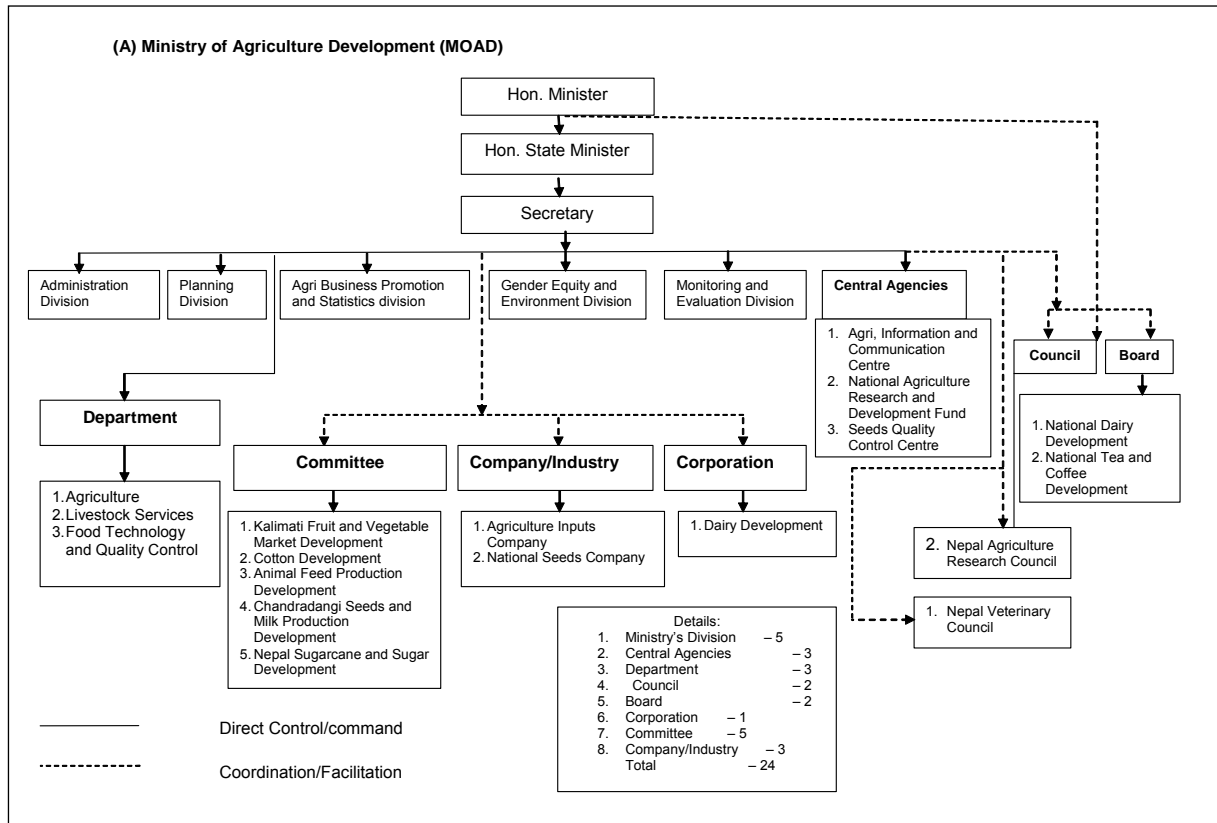
Note: Refer abbreviations and acronyms page

2.6.2 Public Sector

(1) Ministry of Agriculture Development

In the public sector, MOAD is the principal institution responsible for policy formulation and

planning activities for agriculture sector. Within MOAD, the Secretary is assisted by five Joint Secretaries in-charge of Planning, Monitoring and Evaluation; Gender Equity and Environment; Agribusiness Promotion and Statistics; and Administration divisions. The organizational structure is shown in Figure 2.2 below.



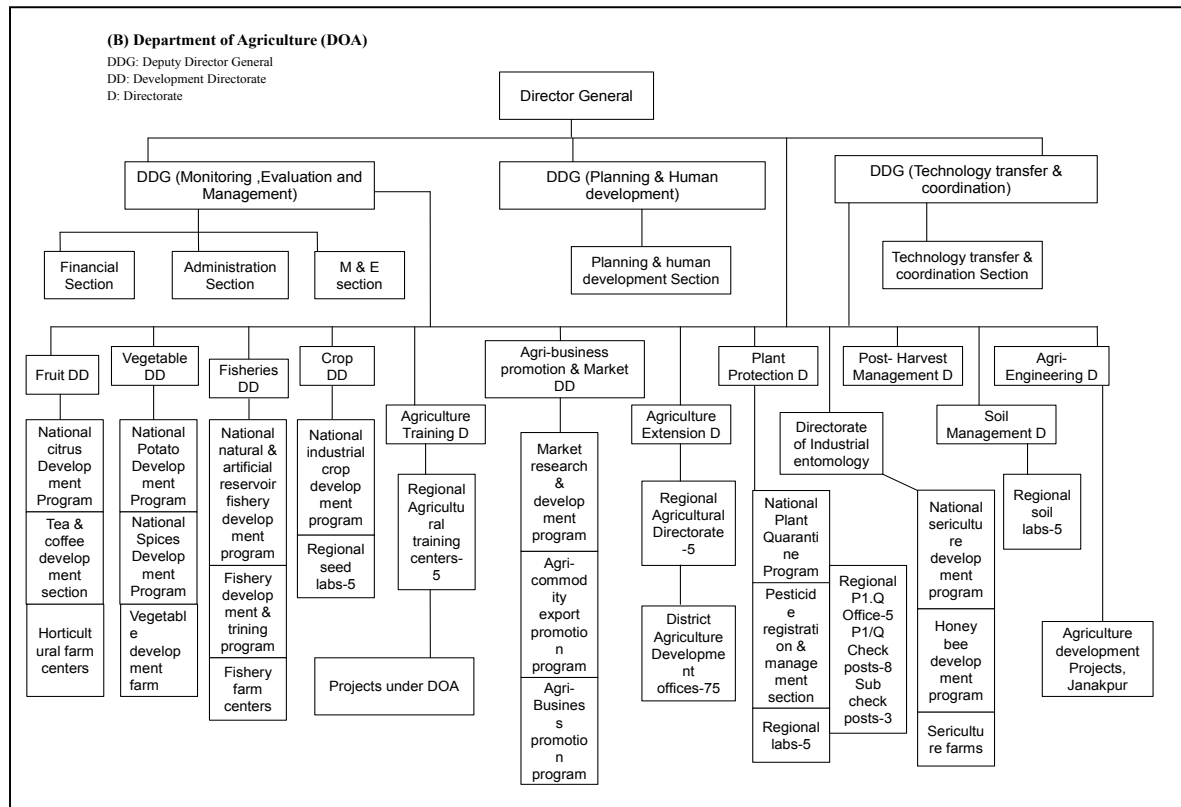
Source: MOAD, 2013

Figure 2.2: Organizational Structure of MOAD

MOAD is further organized into regional directorates, laboratories, centers, training centers, and district offices. Generally, regional offices have supervisory technical backstopping roles and the district offices are responsible for implementing programs and activities in the district.

1) Department of Agriculture

DOA is responsible for implementation of production-oriented programs, technology transfer services, and regulatory functions on crops and fisheries. The broad objective of this department is to support and help achieve food security and poverty alleviation by the transformation of agriculture through diversification and commercialization. DOA's organizational structure is shown in Figure 2.3.



Source: MOAD, 2013

Figure 2.3: Organizational Structure of DOA

Key functions of DOA are as follows: 1) implementation of production-oriented programs, including crop development, horticulture development, fisheries development, and industrial entomology development; 2) implementation of service-oriented programs, including agricultural extension, plant protection, small irrigation, agricultural training, agricultural market development, seeds and quality control, and agricultural engineering services; 3) management and coordination of department level agricultural projects including external assisted projects; and 4) human resource development of staff working under the department. In 2011/12, the government approved Rs.2,934 million which is almost 24% of the total budget (Rs.12,421 million) allocated to the MOAD in 2011/12¹¹.

There are 12 program directorates under DOA that assist the department to formulate policies under their mandates thematic areas (scope of services), plan central level programs, and implement through the respective DADOs.

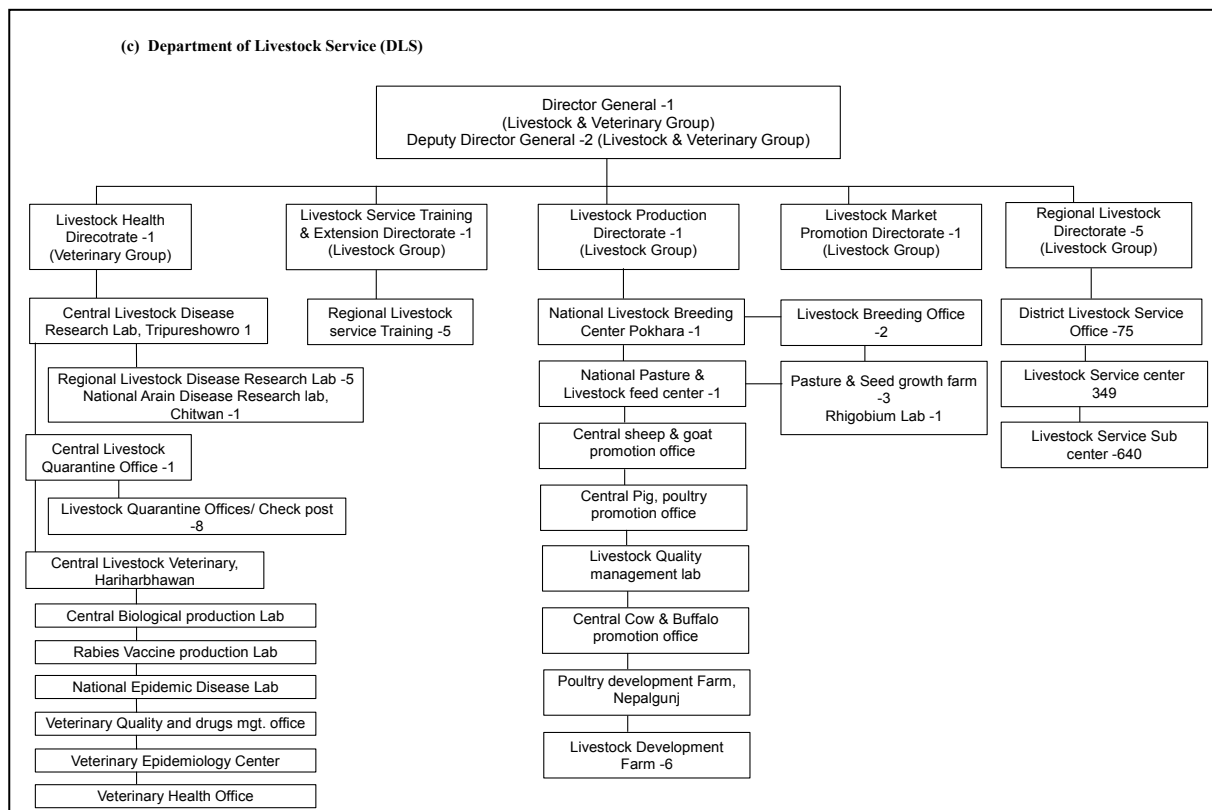
The Regional Agriculture Directorates (RADs) are primarily responsible for administration, coordinating district level planning with technical/program directorates and monitoring the performances of DADOs located in their respective regions. There is one DADO allocated in each of the 75 districts. Under the DADO, there are four to five agricultural service centers (ASCs) placed in each district. Each ASC is responsible for providing services to 10 to 12 Village Development Committees (VDCs). There are 378 ASCs in 75 districts. Field staff members are posted to the service

¹¹ MOAD, 2012

centers (SCs) and sub-service Centers (SSCs) from where they deliver services and some technology demonstration inputs to farmers.

2) Department of Livestock Services

The overall objective of DLS is to contribute to national production through diversification, commercialization, and development of livestock, keeping it as an income generating and respectable vocation. Figure 2.4 shows the organizational structure of DLS.



Source: MOAD, 2013

Figure 2.4: Organizational Structure of DSL

The department's activities can be divided into three major subsectors, namely; (a) Animal health service, (b) Livestock production service, and (c) Livestock training and extension service. Its key functions include:

- Increase production and productivity of livestock products and implement production-oriented programs such as milk, meat, egg, and wool production programs (livestock, poultry, breeds management, technology transfer);
- Implement service-oriented programs (livestock extension service, veterinary services, animal quarantine services, livestock training services, veterinary medicine quality control service, livestock and poultry market development and promotion service, artificial insemination (AI) services, breeding services, pathology services, veterinary diseases diagnostic services, epidemiology services, etc.)

- Manage and coordinate department level livestock development projects including externally assisted projects; and
- Human resource development of staff working under the department.

The total budget of DLS approved by the government in 2011/12 was Rs.1,344 million, which is almost 11% of the total budget (Rs.12,421 million) allocated to MOAD in 2011/12¹².

Parallel to the RADs, the Regional Directorates of Livestock Services (RDLS) is placed in each development region (total of five), and a total of 75 DLSOs (one for each district) is placed. RDLS supports DLSOs in administration, coordinating district level planning with technical directorates and monitoring performances. DLS has 359 livestock SCs and 640 livestock SSCs. Likewise, DLSOs provide services to farmers at the district level. Field staff members are also posted in SCs and SSCs from where they deliver services and some technology demonstration inputs to farmers.

3) Other Departments and Institutions of MOAD

As for other departments, agricultural research system and agricultural and livestock extension system in Nepal, including the Department of Food Technology and Quality Control (DFTQC), Nepal Agricultural Research Council (NARC), details are summarized in Volume II SN1.7.

(2) Ministry of Federal Affairs and Local Development (MOFALD)

The Local Self-Governance Act (LSGA), enacted in 1999, laid the foundation for a local self-governance system in the country. It has statutorily recognized the role of local self-governance and devolution to make local bodies such as District Development Committees (DDCs) and VDCs more responsive and accountable to their populace. The Local Self-Governance Regulation 2000 and the Financial Administration Regulations 2000 stipulated the increase in authority and responsibilities of local bodies.

The government has already devolved basic and primary education, primary health, agriculture (including livestock), and postal services to local bodies in 2001. Apart from this, the Department of Local Infrastructure and Agricultural Road (DOLIDAR) of the MOFALD has shifted its district technical offices that are established in all 75 districts of the country to DDCs in order to operate their tasks under the direct control of DDCs. DDCs are playing a key role in the development of districts as coordinators and facilitators.

Nepal's poverty reduction strategy paper has identified the decentralized governance system as one of its four pillars and MOFALD is regarded as the custodian of this policy. The decentralization procedures are also defined in the TYP which shall be followed for development planning. Volume II SN1.9 presents an organizational chart of MOFALD.

¹² MOAD, 2012

2.6.3 Cooperatives and Farmer Groups including User Groups as Producer Groups

(1) Cooperatives

According to the latest statistics from Department of Cooperatives (DOC)¹³ of the Ministry of Cooperative and Poverty Alleviation, there were 26,501 registered cooperatives in 2012/11 as compared to 830 in 1992.

There is a wide range of types of cooperatives operating in the country, such as milk, agriculture, vegetables and fruits, consumers, coffee, tea, herbs, and bee-keeping agricultural cooperatives. Likewise, non-agricultural cooperatives have diverse types such as electricity, savings and credit, multi-purpose, and health. As one of its characteristics, more than 65% of the total registered cooperatives are non-agricultural cooperatives, of which 68.5% are registered as savings and credit cooperatives (SCCs). This situation implies that SCCs dominate the cooperative sector in Nepal. In light of the agricultural cooperatives, the total registered number is 9,199. Among them are the agricultural cooperatives which accounted 58.4%, followed by milk (19.0%), and consumers (15.4%). Coffee, herbs, and bee-keeping cooperatives represent less than 1% of the total registered agricultural cooperatives. According to the data provided by DOC, more than four million people (nearly 18% of the total population) are currently members in one or more cooperative societies, as of April 2011. Of this figure, 41.7% are women.

The Nepalese economic policy recognizes the cooperative sector as one of its three pillars for economic development. The other two pillars are the public and private sectors. While there has been a tremendous growth in the number of cooperatives, evidence from the field revealed that most of the cooperatives have been operating in very poor conditions. Questions are often raised with regard to the quality of their services. Rapid increase of SCC cooperatives suggested that there is a high demand for microfinance services.

(2) Farmer Groups and User Groups

Compared to cooperatives, farmer groups do not have a specific legal framework. Due to the absence of regulation, there is no obligation for farmer groups to register. According to the latest statistics available from DOA and DLS, there are almost 50,000 farmer groups in the country. Since 1990, most of the development organizations, including the government, donor agencies, and NGOs have adopted group approach in delivering services and transferring technologies to the farmers through groups. As a result, the number of registered farmer groups in Nepal has been increasing for the last five years. The total number of registered agricultural farmer groups and livestock farmer groups in 2011/2012 was 29,989 and 17,668, respectively¹⁴. However, there is no available information regarding the types of activities and activeness of these groups.

As for the user groups, they are formed for the purpose of undertaking physical infrastructural development and management activities such as construction of village/rural roads, installation of

¹³ It is responsible for registration, supervision, regulation, monitoring, and promotion of cooperatives.

¹⁴ Agriculture Extension Directorate, 2012

drinking water taps, managing community forests, plantations, etc., based on three relevant acts, namely, LSGA 1995, Forestry Act 1993, and Water Resource Act 1992. Most of the groups are formed on a temporary basis, undertaking specific activities. Exceptions are community forest user groups (CFUGs) and water user groups (WUGs). CFUGs formulate their respective constitutions and operation plans which are approved by the District Forest Office (DFO). Likewise, WUGs are responsible for the construction, rehabilitation, and management of irrigation schemes.

According to the latest statistics¹⁵, 18,133 CFUGs are managing 17 million ha of community forest in Nepal. This is almost 30.3% of the total forest area in the country. Out of 5,427,302 HHs in Nepal, 2,177,858 HHs are members (42.6%) of any community forests.

2.6.4 Private Sector

< Federation of Nepalese Chambers of Commerce and Industry (FNCCI) and Agro Enterprise Centre (AEC)>

The FNCCI is an umbrella organization of the Nepalese private sector and has been making valuable contributions in agribusiness development and promotion in Nepal. It was established in 1965 with the aim of promoting business and industry while protecting the rights and interests of business and industrial communities. It provides information, advisory, consultative, promotional, and representative services to businesses and government, and organizes trainings/workshops/seminars on a regular basis. The FNCCI membership, at present, comprised 92 district and municipality level chambers in 75 districts of Nepal.

The AEC was established by FNCCI in cooperation with the USAID as an autonomous unit in 1991. The purpose of the AEC is to expand and strengthen market-oriented and private sector driven agro-enterprises in order to increase the value and volume of high-value products sold domestically and internationally. AEC is operated by the board, comprising FNCCI executive members, representative from District Chambers of Commerce & Industry, Commodity Associations, permanent invitees from various related government agencies, and donors. In addition to providing market information services, AEC is involved in several donor funded projects and programs related to agribusiness development and promotion in Nepal. They include Raising Incomes of Small and Medium Farmers (RISMF)¹⁶, HVAP¹⁷, HIMALI¹⁸, and ODOP¹⁹.

¹⁵ CFUG Database, Department of Forests (DOF), Government of Nepal, as of October 20, 2013

¹⁶ RISMF Project (2011–2017) is implemented with the financial support from ADB with a view to reduce the market and business risks for small and medium farmers who diversify into HVCs in ten districts of Nepal's Mid-Western Development Region and Far-Western Development Region, namely, Banke, Bardiya, Dang, Dhailekh, Surkhet, Baitadi, Dadeldhura, Darchula, Doti, and Kailali.

¹⁷ The project (2010–2017) is implemented with the financial support of IFAD for the reduction of poverty and vulnerability of women and men in the hill and mountain areas of the Mid-Western Development Region of Nepal.

¹⁸ HIMALI is implemented (2011–2017) in Nepal with the financial support from ADB. The project intends to assist farmers and downstream enterprises to strengthen linkages, taking advantage of the gradual improvement in infrastructure, to realize the existing demand for mountain products.

¹⁹ ODOP is a PPP-based program officially launched on July 17, 2006 for five years as a pilot project to alleviate poverty in local community and to benefit local producers and the business enterprises through promotion of local products. It was initially called OVOP (One Village One Product) but changed into ODOP following the Nepalese administration unit.

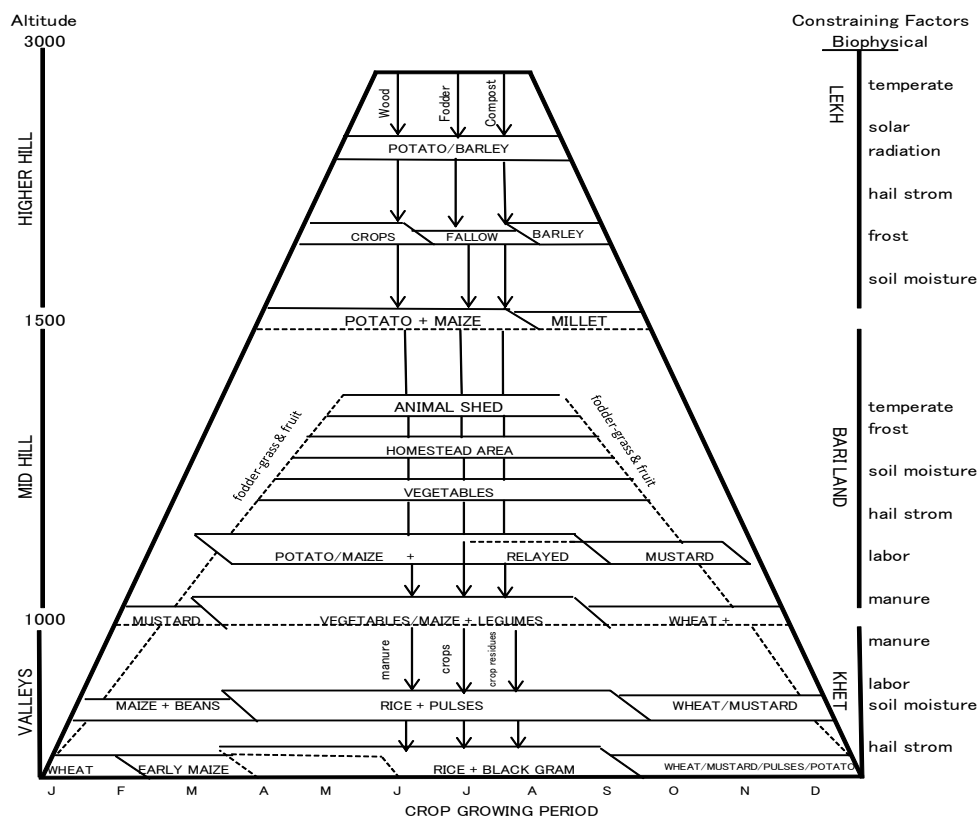
2.7 Agricultural Production

2.7.1 Diversity of Crops Based on Unique Physiographic Form and Agro-Climatic Conditions

Physiographically, Nepal is broadly divided into five roughly parallel east-west regions (ecological belts), which from north to south are known as high mountain, mountain, hill, *siwalik*, and Terai. Farming systems in these five regions are generally characterized into three categories: the mountain, hill, and Terai. The government planning and statistics also follow these categories.

There exist different climates and different types of farming systems within Nepal. As a result of these diversities, a wide variety of crops, vegetables, and fruits are produced. More than 90% of the SRC area falls in the hill area.

Cereals represent more than 75% of the total cropped area in Nepal followed by vegetables and fruits. Generally, the Terai is known as the food basket and it is the principal area for cereal crop production. Likewise, the hill and mountain areas are appropriate for horticultural crops (fruits and vegetables) and the mountainous region for livestock. Yet climate has so endowed to Nepal that different types of fruits and vegetables can be grown in Terai, hill, and mountain. Therefore, in year round irrigated areas in the Terai and some valleys and river basins of the hill area, it is possible to grow two crops of rice in a year. Figure 2.5 depicts the indicative and generalized cropping patterns according to the altitudes, and Table 2.7 shows the major crops grown in different physiographic regions of Nepal.



Source: Chhetri, 2011

Figure 2.5: Schematic Representation of Cropping Patterns as Determined by Altitude in Nepal

Table 2.7: Major Crops Grown in Different Physiographic Regions of Nepal

Crops/ Commodities (Major)	Terai	Hill	Mountain
Cereals	Rice, Wheat, Maize	Rice, Wheat, Maize Barley	Barley, Maize, Naked barley, Fox tail millet, Hog millet, Buckwheat
Pulses	Arahar, Horse Gram, Lentil, Chickpea	Black gram, Pea	Beans
Oilseeds	Mustard	Mustard	-
Cash crops	Potato, Sugarcane, Jute, Tobacco	Potato	Potato
Beverages	Tea	Tea, Coffee	-
Vegetables	Cauliflower, Tomato, Brinjal, Lady's finger, Cucurbits etc.	Cauliflower, Cabbage, Cucurbits, Tomato	Cauliflower, Cabbage, Green leafy vegetables
Fruits	Mango, Litchi, Areca nut, Coconut, Lime, Watermelon, Banana, Jack fruit, Pomegranate (Tropical/sub-tropical fruits)	Citrus (Orange and Sweet orange), Grapes, Guava, Pear, Pomello, Pomegranate, Peach Persimmon, etc (Sub-tropical and temperate fruits)	Apple, Pear, Walnut, Almond (Temperate fruits)

Source: CBS, 2001

A remark worth mentioning with regard to Figure 2.5 is that in the study area with the altitudes of mid-hill to lower higher hill pockets, vegetables can be grown during summer season by taking advantage of cool temperature, while in the low lands such as Terai and India this season is clearly the off crop seasons for most vegetables.

2.7.2 Cultivated Land, Land Holding Size, and Tenancy

(1) Cultivated Land

Table 2.8 shows the distribution of cultivated land by ecological zones. Nearly one-fifth of land is cultivated in Nepal. The relatively higher portion of cultivated land lies in Terai (39.5%) followed by the hill area (27.5%), and mountain area (4.0%). Out of the total cultivated land, more than half is located in Terai (51.7%) while very little in the mountain area (8.3%).

Table 2.8: Status of Cultivated Land in Nepal

Agro-Ecological Zone (AEZ)	Cultivated Land (Nepal) (sq km)	Total Land, (sq km)	Cultivated Land as percent of Total Land
Mountain	2,525	63,086	4.0
Hill	12,232	44,436	27.5
Terai	15,772	39,962	39.5
Total	30,529	147,484	20.7

Source: Water and Energy Commission Secretariat (WECS), 2010

(2) Land Holding Size and Distribution

Land distribution in Nepal is highly skewed. More than two-thirds of the total landholders have less

than 1 ha, and own only 30% of the total farm area. Their average land size is only 0.42 ha. On the other hand, 1.5% of the land holders own more than 5 ha, which cover 14% of the total farm area in Nepal. Land tenure information indicates that farm size is larger in Terai at 1.29 ha than in the hills at 0.77 ha or mountains at 0.66 ha. The farm land in Nepal is not only unevenly distributed but also increasingly being fragmented.

Table 2.9: Size Distribution of Agricultural Land Ownership by Households and Region

(in percent)

Region/ Holding	Mountains		Hills		Terai	
	Total Holdings	Total Area	Total Holdings	Total Area	Total Holdings	Total Area
< 0.5 ha	45.8	17.3	50.1	19.8	44.6	10.6
0.5 - 1 ha	31	29.4	30.7	32.5	23.2	17.2
1.0 - 2.0 ha	17.8	32.2	15.4	30.7	20.1	28.7
2.0 - 3 ha	3.7	11.8	2.8	9.8	7	17.4
>3.0 ha	1.7	9.3	1.0	7.2	5.1	26.1
Total	100	100	100	100	100	100

Source: CBS, 2002²⁰

(3) Land Tenancy

The dominant type of land entitlement in Nepal is owner-tiller. About 85% of the land is owner-operated and the remaining 15% is rented as shown in Table 2.10.

Table 2.10: Distribution of Agricultural Land Ownership by Physiographic Region

Region/ Operation	Percent of Total Operated Land	
	Owner operated	Rented-in
Mountains	89.4	10.6
Hills	89.1	10.9
Terai	80.1	19.9
Nepal	84.7	15.3

Source: CBS, 2002

2.7.3 Production of Main Agriculture Crops

(1) Cereals

Paddy is the most important cereal crop in Nepal. It contributes nearly 20% to the agricultural GDP and provides more than 50% of the total caloric requirement to the Nepalese people.

Table 2.11 shows the share in the production of different cereal crops by physiographic regions. Paddy crop contributed to more than 50% of the total cereal crop production followed by maize (23.1%), wheat (19.5%), millets (3.3%), and barley (0.4%). The Terai region contributed to 56.9% of cereal production in the country followed by the hill at 37.5% and mountain at 5.6%.

²⁰ The planned census in 2011 has not yet completed, this is the most recent available data.

Table 2.11: Production of Major Cereal Crops and Their Shares by Physiographic Region, 2011/12

Crops	Total Production		Share in Production (percent)				Yield (kg/ha)
	MT	Percent	Mountain	Hill	Terai	Total	
Paddy	5,072,248	53.7	3.0	23.7	73.2	100.0	3,312
Maize	2,179,414	23.1	9.9	70.1	20.0	100.0	2,501
Millets	315,067	3.3	20.0	76.7	3.2	100.0	1,133
Wheat	1,846,142	19.5	3.7	30.2	66.1	100.0	2,412
Barley	34,829.8	0.4	58.6	36.1	5.3	100.0	1,245
Total	9,447,701	100.0	5.6	37.5	56.9	100.0	2,719

Source: Computed from SINA, MOAD 2012.

(2) Cash Crops

Area under major cash crops as percentage of total cultivated area and their yield between 2003/04 and 2011/12 are shown in Table 2.12.

Table 2.12: Area under Major Cash Crops as Percentage of Total Cultivated Area and Yield

Year	Yield (kg/ha)			
	Oilseed	Potato	Sugarcane	Jute
2003/04	711	11,490	38,794	1,433
2004/05	756	11,846	40,217	1,452
2005/06	741	13,090	39,682	1,428
2006/07	736	12,657	40,610	1,434
2007/08	745	13,110	39,475	1,466
2008/09	747	13,326	40,523	1,512
2009/10	781	13,584	42,790	1,233
2010/11	824	13,735	43,148	1,365
2011/12	834	13,584	45,447	1,369
Annual Growth Rate (%)	1.71	2.09	1.67	(1.01)

Source: Computed from SINA, MOAD 2012.

(3) Vegetables and Fruits

The APP emphasizes the importance of vegetables and fruits as HVCs. Production of vegetables and fruits, all in cultivated areas, as well its production volume and yield, have grown over the last seven years as summarized in Table 2.13.

Table 2.13: Area, Production and Yields of Vegetables and Fruits (2003/04 and 2011/12)

Year	Vegetables			Fruits			
	Area (ha)	Production (MT)	Yield (mt/ha)	Area	Productive Area (ha)	Production (MT)	Yield (mt/ha)
2003/04	172,586	1,890,100	11.0	86,707	54,112	511,397	9.5
2004/05	180,823	2,065,193	11.4	89,312	55,348	552,879	10.0
2005/06	189,832	2,190,100	11.5	91,923	56,548	535,449	9.5
2006/07	191,922	2,298,689	12.0	94,901	57,595	575,095	9.5
2007/08	208,108	2,538,904	12.2	100,099	63,432	630,563	9.9
2008/09	225,154	2,754,406	12.2	103,651	68,785	686,213	10.0
2009/10	235,098	3,003,821	12.8	107,322	70,722	706,972	10.0
2010/11	244,102	3,203,563	13.1	117,932	79,184	794,164	10.0
2011/12	245,037	3,298,816	13.5	139,321	101,233	1,029,754	10.2
Annual Growth Rate (%)	4.93	7.53	2.47	5.35	7.26	8.00	0.73

Source: Computed from SINA, MOAD 2012.

2.7.4 Production of Livestock and Livestock Products

The productions of milk and meat have increased at a rate of 3.4% and 4.0% per annum, respectively, from 2003/04 to 2011/12 as shown in Table 2.14.

Table 2.14: Milk and Meat Production

Year	Milk production, MT			Meat (net) Production						
	Total	Cow	Buffalo	Total	Buffalo	Mutton (Sheep)	Goat	Pig	Chicken	Duck
2003/04	1,231,853	368,531	863,322	208,412	133,600	2,779	40,540	15,389	15,881	223
2004/05	1,274,228	379,637	894,591	214,817	138,953	2,744	41,698	15,724	15,461	237
2005/06	1,312,140	385,290	926,850	219,205	142,040	2,737	42,820	15,773	15,605	230
2006/07	1,351,394	392,791	958,603	227,105	147,031	2,747	44,933	16,035	16,126	233
2007/08	1,388,730	400,950	987,780	233,897	151,690	2,733	46,188	16,425	16,632	229
2008/09	1,445,419	413,919	1,031,500	241,690	156,627	2,711	48,472	16,992	16,662	226
2009/10	1,497,429	429,129	1,068,300	250,213	162,358	2,705	50,315	17,059	17,551	225
2010/11	1,556,510	447,185	1,109,325	277,625	167,868	2,722	52,809	17,923	36,085	218
2011/12	1,622,751	468,913	1,153,838	287,930	172,414	2,720	53,956	18,277	40,603	217
Annual Growth Rate (%)	3.45	2.91	3.67	4.06	3.25	(0.24)	3.82	2.18	11.56	(0.72)

Source: Computed from SINA, MOAD 2012.

2.8 Agricultural Inputs

2.8.1 Fertilizers

As the country does not produce chemical fertilizers, all fertilizers are imported. Most of the fertilizers are imported from India under a government-to-government system or permission from the Government of India. No agencies in India can export fertilizers without the permission of India's central government. The main public importer of chemical fertilizers in Nepal is the Agriculture Inputs Company Private Limited (AICL)²¹. Private traders are also allowed to import fertilizers, and in this case, the fertilizers are distributed by district dealers to agro-vets or cooperatives to farmers. However, they would not be able to get subsidized fertilizers for sale, which means that fertilizers are legally controlled by AICL.

The quality of fertilizer is defined in the Fertilizer Control Order (FCO), and the Fertilizer Unit under MOAD is responsible for ensuring the quality of fertilizers traded in the country. Given that fertilizers are subsidized by the government, pricing system is controlled by MOAD which is subject to change depending on the imported prices. Table 2.15²² presents the import of fertilizer in Nepal from public (Agriculture Input Corporation Limited) and private sources.

²¹ Earlier, there used to be Agriculture Inputs Corporation (AIC) which dealt with both seeds and chemical fertilizers. AIC was divided into AICL and National Seeds Company Ltd. (NSCL) in 2002 to establish two companies under the company act, the former to deal with the fertilizer and the latter to deal with the seeds.

²² Considering the actual amount used in the field would not fluctuate much year-by-year, there is no accurate information on the actual amount of imported fertilizer, both formally and informally.

Table 2.15: Annual Sales of Chemical Fertilizers

(Unit: MT)

Year	Public	Private sector	Total
2003/04	20,493	118,265	138,758
2004/05	31,811	90,895	122,706
2005/06	13,295	78,258	91,553
2006/07	25,169	65,679	90,848
2007/08	6,646	47,107	53,753
2008/09	7,133	5,677	12,810
2009/10*	10,329	0	10,329
2010/11*	110,013	0	110,013
2011/12*	144,814	0	144,814
Annual Growth Rate (%)	17.70	(39.1)	(10.2)

Note: Private sector has not imported fertilizers since 2009/10

Source: Computed from SINA, MOAD 2012.

As seen in Table 2.16, the difference of fertilizer prices between India and Nepal has increased. As a result, the fertilizer distribution system in Nepal has almost nullified. Farmers in the Terai area have also been getting fertilizers through informal cross-border trade between two countries. The government has neither been able to improve the supply of fertilizers nor ensure the quality of fertilizers through effective implementation of FCO. As long as the fertilizer price of India remains lower than in Nepal, there will be incentives for inflows of fertilizer from India.

Table 2.16: Fertilizer Price Differentials between India and Nepal

(Rs./mt)

Country	Urea (Nitrogen)		DAP (Di-ammonium phosphate)		MOP (Potash)	
	2007	2012	2007	2012	2007	2010
Nepal *	24,000	18,000	25,000	32,000	13,600	20,000
India**	7,008	8,496	14,960	25,909	7,128	14,618

* Retail prices vary by locations. ** <http://fert.nic.in/page/fertilizers-accounts>

Source: Computed from SINA, MOAD 2012.

2.8.2 Seeds

Unlike fertilizer, the seed sector is deregulated in Nepal. The private companies, farmers, and cooperatives can produce breeders, foundation, certified, and improved seeds. However, only the NARC can produce the breeder seeds. Figure 2.6 below shows the distribution system of cereal seeds in Nepal. Vegetable seeds are produced by the government and private farms, and distributed like cereal seeds.

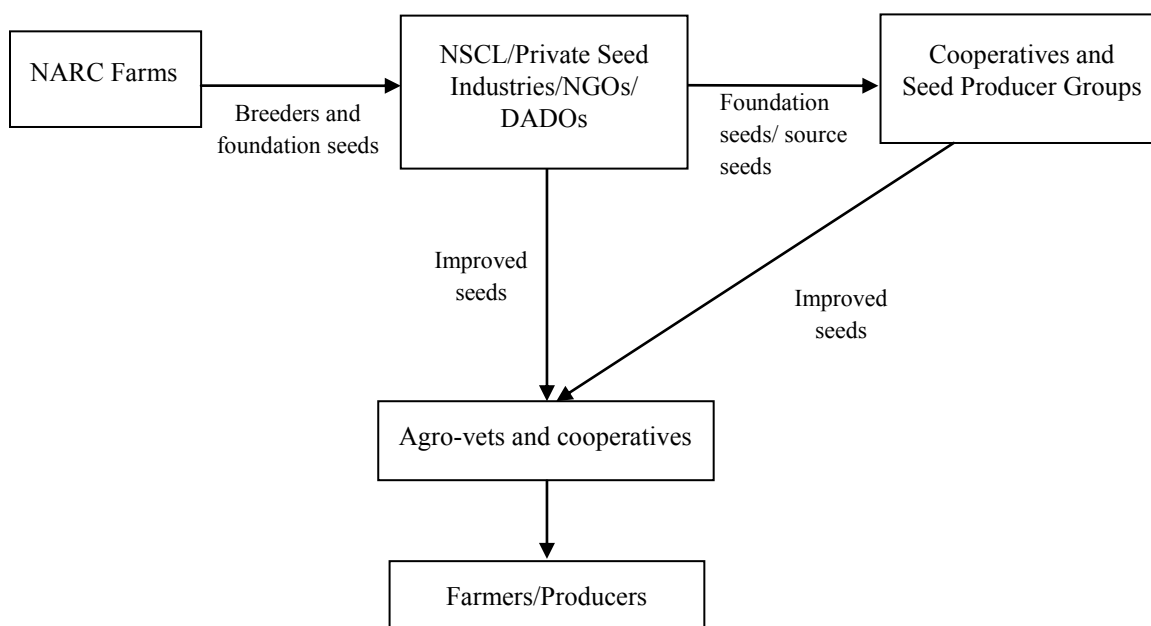


Figure 2.6: Seeds Supply Routes

2.8.3 Chemicals

All chemicals, including pesticides, are handled by the private traders. There is no subsidy for the pesticides. Importers registered under the Pesticides Registrar of DOA, import pesticides from India, China, and other countries and sell them to agro-vets and very rarely to agricultural cooperatives at wholesale prices. Pesticide inspectors designated as per the Plant Protection Act are expected to monitor the quality of pesticides.

2.8.4 Other Agricultural Materials and Equipment

For other agricultural materials and equipment, including pesticide application equipment, livestock medicines, animal feeds, and plastic sheets, there is no established system like those for seeds and fertilizers. Some equipment is directly ordered by private traders from India, China, or other third countries. The government, particularly MOAD has no power and authority to regulate the prices and quality of materials and equipment.

2.9 Agricultural Finance

2.9.1 Micro Finance

The government has been giving due priority to provide agricultural credit and finance to the farmers. ADB was specifically established to provide credit to farmers, although this bank has now been upgraded to the status of a commercial bank and transformed into a public company. Table 2.17 presents the flow of agriculture credit to the Nepalese farmers through this bank over the last ten years. Table 2.17 reveals that the bank has shifted its priority sector for investment to other sectors: investment in the agriculture sector has decreased at 16.4% yearly while that in other sector increases by 101%.

Table 2.17: Distribution of Agricultural Credit through Agricultural Development Bank

(Unit: In millions)

Year	Credit to Agricultural Sector	Credit to Other Sectors	Total
2002/03	9,411	559	9,969
2006/07	12,255	2,396	14,650
2011/12	15,820	37,037	52,857
Annual Growth Rate (%)	(16.4)	101.0	32.0

Source: Computed from various issues of Statistical information in Nepalese Agriculture

Various models of microfinance such as Grameen replication, financial intermediary NGO Model, and cooperative societies focusing on poor and microfinance have been operating. As of mid-July 2012, there are a total of 24 microfinance development banks and 36 financial intermediary NGOs, 16 SCCs with limited banking²³ and 11,851 SCCs. Statistics showed more than 1 million poor people have benefited from microfinance services; however, financial outreach to the rural poor is still only about half of the needy target groups due to inadequacy of microfinance services in terms of both service coverage and loan amount.

2.9.2 Crop and Livestock Insurance

In recent years, there has been no involvement by the private commercial insurance sector in crop and livestock insurance. Although the formal insurance sector does not offer agricultural insurance products, some entities are involved in providing insurance protection, usually linked directly to public or private credit and microfinance operations. Based on the lessons of several past projects and programs, the Government of Nepal recently issued the "Guidelines for Providing Subsidy on Insurance Premium for Crops and Livestock, 2013".

The government had allocated Rs.20 million in 2013/14 to subsidize 50% of the premium amount paid by the farmers. The government's decision to introduce insurance schemes for crops and livestock had paved the way for insurance companies to launch insurance crops and livestock schemes, and banks and financial institutions to channel more funds into the agriculture sector. However, it is not clear how many farmers have purchased such insurance.

2.10 Agricultural Trade

2.10.1 Import and Export

Increased proportion of agricultural products export vis-à-vis total export is indicative of country's commercialization, competitiveness of the agricultural production system and level of agricultural development. Nepal's major trade partner is India in terms of the value account of both export and import which is almost the same as or more than that of the other countries combined. Table 2.18 presents the key commodities exported to India and other countries. Nepal's leading agricultural exports are herbs, pulses, cardamom, tea, ginger, betel nuts, beans, lentils, and oil cake.

²³ Nepal Rastra Bank (NRB), 2012

Table 2.18: Ten Key Commodities Exported to India and Other Countries, 2012

Commodities Exported to India		Commodities Exported to Other Countries	
Commodities	Value (Rs Million)	Commodities	Value (Rs Million)
Herbs	3,027.1	Pulses	2,497.0
Cardamom	803.6	Tanned skin	723.5
Oil Cakes	642.7	Paper and paper products	587.3
Skin	382.4	Tea	251.8
Ghee (Vegetable)	371	Herbs	197.7
Ginger	366.6		
Ghee(Clarified)	366.6		
Rosin	315.2		
Live Animals	248.8		
Pulses	202.5		
Total value	7,276.5		4,257.3

Source: Computed from NRB, Quarterly Economic Bulletin April-May, 2013 Vol 47 (3). NRB, Kathmandu

Table 2.19 presents the key commodities imported from India and other countries. Nepal's major import commodities are rice, crude soybean oil, crude palm oil, vegetables, fertilizers, etc.

Table 2.19: Ten Key Commodities Imported from India and Other Countries, 2012

India		Other Countries	
Commodities	Value (Rs Million)	Commodities	Value (Rs Million)
Rice	4,267.0	Crude Soybean Oil	9,962.3
Agri. Equip.& Parts	4,145.8	Crude Palm Oil	4,210.6
Vegetables	2,589.5	Edible Oil	2,794.1
Paper	2,278.1	Chemical Fertilizers	2,291.3
Tobacco	1,916.8	Betelnut	1,639.2
Baby Food & Milk Products	979.1	Raw Wool	657.2
Insecticides	942.4	Palm oil	312.6
Fruits	857.6	Powder Milk	300.6
Cumin seed	702.3	Small Cardamom	286.9
Live animals	422.9	Insecticides	206.7
Total export value		Total export value	

Source: Computed from Nepal Rastra Bank, Quarterly Economic Bulletin April-May, 2013 Vol 47 (3). Nepal Rastra Bank, Kathmandu

Table 2.20 summarizes the trade statistics of livestock produce. Annual export of livestock produce from Nepal includes processed products amounting to Rs.173 million, while import is Rs.1,476 million. This revealed that annual trade deficit of Nepal is Rs.1,302 million.

Table 2.20: Import and Export of Livestock Commodities, 2012

(Unit: Rs millions)

Commodities	Export	Import	Trade Balance
Live Animal	248.8	422.9	(174.1)
Skin	1,105.9		1,105.9
Powder Milk		300.6	(300.6)
Baby Food & Milk Products		979.1	(979.1)
Raw Wool		657.2	(657.2)
Total	1,354.7	2,359.8	(1,005.1)

Source: Computed from NRB, Quarterly Economic Bulletin April-May, 2013 Vol 47 (3). NRB, Kathmandu

2.11 Demand of HVCs based on Turn Volumes

2.11.1 Arrivals of Vegetables, Fruits, and Spices in Kalimati Market

In order to know the demand trends for vegetables and fruits in Nepal, data on change in market arrivals of HVCs was analyzed. Table 2.21 presents the market arrivals of major vegetables in Kalimati Market during 2005 and 2012. The total volume of vegetables arrivals in Kalimati Market became almost double during this period. This revealed that consumption of vegetable is rapidly increasing.

Table 2.21: Market Arrivals of Vegetables in Kalimati Market between 2005 and 2012

Year	Market Arrival			Annual Growth Rate, (%) during 2005-2012
	2005 (MT)	2012 (MT)	Percent Change	
Tomato Big	1,543	4,693	204.2	17.2
Tomato Small	13,115	21,052	60.5	7.0
Potato Red	19,086	38,303	100.7	10.5
Potato White	5,761	8,981	55.9	6.5
Onion Dry	9,066	21,251	134.4	12.9
Carrot	922	2,577	179.5	15.8
Cabbage	7,700	13,708	78.0	8.6
Cauli Local	11,459	23,217	102.6	10.6
Cauli Terai	2,038	1,625	(20.2)	(3.2)
Raddish Red	458	43	(90.5)	(28.6)
Raddish White	4,399	5955	35.4	4.4
Brinjal Long	1,955	4,788	144.9	13.6
Brinjal Round	292	152	(47.8)	(8.9)
Cow pea	1,580	3,210	103.1	10.7
Green Peas	1,140	2,762	142.3	13.5
French Bean	3,206	4,302	34.2	4.3
Sword Bean	531	358	(32.6)	(5.5)
Soyabean Green	242	75	(69.1)	(15.4)
Bitter Gourd	1,792	4,731	164.0	14.9
Bottle Gourd	2,400	4,611	92.1	9.8
Pointed Gourd	1,731	2,601	50.3	6.0
Snake Gourd	196	658	235.5	18.9

Year	Market Arrival			Annual Growth Rate, (%) during 2005-2012
	2005 (MT)	2012 (MT)	Percent Change	
Smooth Gourd	1,023	2,896	183.1	16.0
Sponge Gourd	77	8	(89.4)	(27.4)
Pumpkin	1,148	1,640	42.8	5.2
Squash	1,315	3,064	133.0	12.8
Turnip	311	7	(97.7)	(41.5)
Okara	1,748	2,123	21.5	2.8
Sweet Potato	90	205	127.4	12.5
Barela	303	398	31.3	4.0
Arum	296	233	(21.1)	(3.3)
Christophine	1,014	1,308	29.0	3.7
Broad Leaf Mustard	1,129	557	(50.7)	(9.6)
Spinach Leaf	648	352	(45.6)	(8.3)
Cress Leaf	455	142	(68.9)	(15.4)
Mustard Leaf	844	276	(67.3)	(14.8)
Fenugreek Leaf	447	108	(75.8)	(18.3)
Onion Green	793	994	25.3	3.3
Bakula	8	131	1,534.1	49.0
Yam	957	1,270	32.7	4.1
Mushroom	69	549	695.8	34.5
Asparagus	2	41	1,949.9	54.0
Neuro	75	42	(44.3)	(8.0)
Brocauli	119	336	182.6	16.0
Sugarbeet	73	21	(70.9)	(16.2)
Drumstick	24	15	(38.2)	(6.7)
Bauhanian Flower	16	97	508.8	29.4
Red Cabbage	2	13	558.3	30.9
Lettuce	348	69	(80.3)	(20.7)
Knolkhol	83	11	(87.3)	(25.5)
Celery	7	9	31.9	4.0
Parseley	6	10	58.9	6.8
Fennel Leaf	97	94	(3.6)	(0.5)
Mint	1	10	886.5	38.7
Turnip A	604	95	(84.3)	(23.3)
Cucumber	4,285	6,886	60.7	7.0
Total	109,029	193,660	77.6	8.6

Source: Computed from Agriculture Marketing Information Bulletin of ABPMDD, DoA, (2005 & 2012) and Database of Kalimati Market.

As shown in Table 2.22, market arrivals of fruits in Kalimati increased from 11,741 tons in 2005 to 27,530 tons in 2012, which is 214% increment compared to 2005. During this period, fruits arrivals in Kalimati Market increased by 134% from 2005.

Table 2.22: Market Arrivals of Fruits in Kalimati Market between 2005 and 2012

Year	Market Arrival			Annual Growth Rate, (%) during 2005-2010
	2005 (MT)	2012 (MT)	Percent Change	
Apple	282	2,297	714.5	34.9
Banana	118	577	388.6	25.4
Lime	2,520	1,854	(26.4)	(4.3)
Pomegranate	114	130	14.3	1.9
Mango	148	2,821	1,806.0	52.4
Grapes	34	158	364.1	24.5
Orange	3,675	11,860	222.7	18.2
Water Melon	255	4,354	1,607.3	50.0
Sweet Orange	166	475	186.2	16.2
Mandarin	14	31	121.5	12.0
Pineapple	104	191	83.4	9.0
Jackfruit	375	1,045	178.8	15.8
Lemon	17	42	147.6	13.8
Sweet Lime	33	15	(54.5)	(10.7)
Pear	174	164	(5.6)	(0.8)
Papaya	419	756	80.3	8.8
Guava	1	329	32,815.0	128.9
Mombin	171	80	(53.4)	(10.3)
Litchi	25	78	211.0	17.6
Musk Melon	-	238	-	-
Sugarcane	83	14	(83.4)	(22.7)
Kinnow	25	23	(8.4)	(1.3)
Strawberry	4	0	(98.0)	(42.8)
Total	8,757	27,530	214.4	17.8

Source: Computed from Agriculture Marketing Information Bulletin of ABPMDD, DoA, (2005 & 2012) and Database of Kalimati Market.

Table 2.23 presents the market arrivals of spices in Kalimati Market during 2005 and 2012. Volume of spices arrivals in Kalimati Market increased from 9,114 tons in 2005 to 10,401 tons in 2012, which is 14% higher than that of 2005. This revealed that consumption of spices is rather stagnant.

Table 2.23: Market Arrivals of Spices in Kalimati Market between 2005 and 2012

Year	Market Arrival			Annual Growth Rate, (%) during 2005-2012
	2005 (MT)	2012 (MT)	Percent change	
Ginger	1,657	2,923	76.4	8.4
Chilli Dry	307	57	(81.5)	(21.4)
Chilli Green	2,997	3,310	10.4	1.4
Capsicum	410	1,330	224.4	18.3
Garlic Green	339	190	(43.8)	(7.9)
Coriander Green	651	326	(49.9)	(9.4)
Garlic Dry Chinese	1,979	1,420	(28.3)	(4.6)

Year	Market Arrival			Annual Growth Rate, (%) during 2005-2012
	2005 (MT)	2012 (MT)	Percent change	
Garlic Dry Nepali	755	834	10.5	1.4
Clive Dry	20	0	(99.0)	(48.2)
Clive Green	-	10	-	-
Total	9,114	10,401	14.1	1.9

Source: Computed from Agriculture Marketing Information Bulletin of ABPMDD, DoA, (2005 & 2012) and Database of Kalimati Market.

2.11.2 Arrivals of Vegetables and Fruits from SRC Districts to Kalimati Market

Red potato, tomato, and cauliflower are the three main commodities arriving in Kalimati Market. These three commodities share more than three-fourths of the turn volume of agricultural production in Kalimati Market. Likewise, orange is the main fruit commodity while ginger in case of spices, are arriving in Kalimati Market from the study districts. The product arrives from Kavre includes the Sindhupalchok account, since there is no disaggregated data in Kalimati Market on the arrival of different commodities by district. Volume II (SN2.1 Table 1.41) presents the share of commodities arrival from Kavre and Dolakha in 2012.

There is no available information on the market arrival of agricultural commodities from Sindhuli and Ramechhap districts. However, district stakeholders and market stakeholders informed that market arrival of vegetables is almost negligible from Sindhuli and Ramechhap. These districts generally produce for their own consumption and sale in the local market. Likewise, these districts import vegetables from nearby Terai area.

Out of the total market arrivals in Kalimati Market, nearly 12% of the agricultural product arrivals came from Kavre District²⁴ furthermore, there are no available information on market arrivals from other SRC districts. The products originating from Dolakha might also have included in the total products coming from Kavre. Volume II (SN2.1 Table 1.42) presents details on the different commodities which arrive in Kalimati Market.

2.11.3 Arrival of Goat in Kathmandu Market

The Kathmandu Chaupaya Kharid Bikri Private Limited holds over 90% share of goat sales in Kalanki Bazaar, the biggest goat market in Kathmandu Valley. According to FY 2011/12 data, 72% of handling goats are traded by the private company, almost 80% of which are imported from India and only 20% are domestic goats. This trend has not changed in the past three years (See Table 2.24).

²⁴ Table 2.56, Volume II

Table 2.24: Trend of Goat Transaction on Kathmandu Chaupaya Kharid Bikri

Fiscal Year	Number of Transacted Goat					Credit to Other Sectors		
	Imported	%	Internal	%	Total	Average	Min.	Max.
2000/01	221,500	71.83	86,854	28.17	308,354	110	100	120
2001/02	225,260	74.75	76,101	25.25	301,361	125	120	130
2002/03	251,650	80.42	61,280	19.58	312,930	132.5	125	140
2003/04	241,584	86.11	38,981	13.89	280,565	157.5	135	180
2009/10	235,407	80.66	56,455	19.34	291,862	192.5	180	205
2010/11	243,723	79.87	61,430	20.13	305,153	227.5	205	250
2011/12	256,570	79.58	65,817	20.42	322,387	275	250	300

Source: Kathmandu Chaupaya Kharid Bikri Pvt. Ltd. Sep. 2012

There are two major reasons for the large number of imported Indian goats in the market.

(1) Transportation Efficiency

Capacity of a freight truck for goat transportation is around 200-250 heads per load. This company operates 8–10 trucks per week, twice a week on Thursday and Sunday. In order to be cost efficient, traders need to fill up the truck at every collection. Therefore, the company prefers imported goats from India since the company is capable of collecting and filling up their truck with certain amount of goats at once. In terms of transportation efficiency, Indian goats have an advantage despite the long distance between India and Kathmandu.

(2) Yield Ratio of Meat Processing

The company buys Indian goats weighing from 25 kg to 60 kg, which will take six months to two years to grow in India, while it takes one to five years in Nepal. All the waste after processing is around 25%-35% of live weight for Indian goats (65%-75% meat yield), while domestic goats range between 25% and 60% (40%-75% meat yield). Yield ratio is an important factor to determine the unit price (price/kg). Indian goats have higher meat yield than domestic goats.

2.11.4 Current Condition in SRC for Commercial Goat Production

No foundation for commercial production is established that aims for trading in Kathmandu Market in the SRC area. Major incentives to sell goats in the SRC area are as follows; 1) gain cash income, 2) cut down heads due to over-capacity of feeding; 3) release goats with diseases or reproductive problem, and 4) interaction with traders who visit the village. Farmers have no strategic planning for sales activities.

2.11.5 Arrival of Milk in Kathmandu and Current Production Volume of the SRC Area

Both the total volume of milk arriving in Kathmandu and its current production volume in the SRC area are not clear as there is no appropriate data available. However, it is certain that the demand for milk in Kathmandu will increase as the population in Kathmandu Valley is rapidly increasing²⁵.

²⁵ According to CBS, 2012, the population in Kathmandu Valley has increased by 0.9 million between 2001 and 2012.

CHAPTER 3 AGRICULTURAL DEVELOPMENT IN SRC DISTRICTS

3.1 Position of SRC Districts in Nepal

3.1.1 Characteristics of Study Districts

Table 3.1 presents the basic information of the study districts such as area, population, literacy rate, and poverty incidence.

Table 3.1: Basic Data of the Study Districts

#	Particulars	Unit	Study Districts				Nepal
			Kavre	Dolakha	Ramechhap	Sindhuli	
1	Area	km ²	1,396	2,191	1,546	2,491	147,181
2	Population*	no.	381,937	186,557	202,646	296,192	26,494,504
3	Male*	no.	182,936	87,003	93,386	142,123	12,849,041
4	Female*	no.	199,001	99,554	109,260	154,069	13,645,463
5	Sex Ratio*	%	91.93	87.39	85.47	92.25	94.16
6	Total Households*	no.	80,720	45,688	43,910	57,581	5,427,302
7	Average HH size*	no.	4.73	4.08	4.62	5.14	4.88
8	Population density*	no./km ²	274	85	131	119	180
9	Proportion of urban population*	%	15.5	5.9		13.3	17.1
10	Literacy rate*	%	63.7	50.6	39	50.1	53.5
11	Poverty incidence**	%	13.9	26.0	25.6	38.3	25.2

Source: * CBS, 2012; ** CBS 2013 b

(1) Population

Based on the population census of 2011, the total population in the SRC districts stands at 1,067,332 with highest population recorded in Kavre District at 381,937 followed by Sindhuli (296,192), Ramechhap (202,646), and Dolakha (186,557). Compared to the 2001 Census Population, the annual growth rate is positive in Sindhuli (0.6%) and negative in Kavre (-0.1%), Dolakha (-0.1%), and Ramechhap (-0.5%) districts. The percentage of female population is high compared to male across the entire four districts. Sex ratio, i.e., number of males per every 100 females is highest in Sindhuli and Kavre (92 each) followed by Dolakha (87) and Ramechhap (86).

Population density per square kilometer of land is highest in Kavre (274) followed by Sindhuli (119), Ramechhap (131), and Dolakha (85).

(2) Ethnicity

A total of 22 different ethnic groups reside within the SRC districts²⁶. An outstanding characteristic in the study area is that the ethnic Tamang residents, which comprise only 5% of the total population in Nepal, account for around 30% of the population in Kavre and Sindhuli districts.

In case of Kavre District, more than one-third of the population belongs to Tamang ethnicity and more than one-fifth of the population belongs to Bahun ethnicity. In Dolakha District, 34.3% of the

²⁶ CBS had not yet published ethnicity and other demographic information based on 2011 Census by districts as well as VDCs. Hence, the Study used data of the last census (2001), however, no updated information is available.

population belongs to Chhetri group followed by Tamang (15.3%) and Bahun (10.4 %). Chhetri and Tamang are the dominant ethnic groups in Ramechhap District occupying 26.6% and 20.0% of the total district population, respectively. In case of Sindhuli District, major ethnic groups include Tamang occupying nearly 26%, Chhetri (14.5%), and Magar (14.3%). Table 3.2 presents the population by ethnic groups in the SRC districts.

Table 3.2: Population by Ethnic Groups in the SRC Districts

(Unit: percent)

#	Ethnicity	Population			
		Kavre	Dolakha	Ramechhap	Sindhuli
1	Tamang	33.9	15.3	20	25.6
2	Bahun	22.8	10.4	5.7	9.2
3	Chhetri	13.2	34.3	26.6	14.5
4	Newar	13	8.3	14.2	6.5
5	Dalit	5.9	8.8	8.2	11.3
6	Magar	3.5	1.9	11	14.3
7	Danuwar	1.5	NA	NA	4.4
8	Majhi	0.7	NA	2.6	3.4
9	Sherpa	0.3	5.4	2.2	0
10	Thami	NA	7.7	0.7	NA
11	Sunwar	NA	1.2	4.2	2.6
12	Others	5.2	6.7	4.6	8.2
	Total	100	100	100	100

Source: CBS, 2002

(3) Economically Active Population

Across all the SRC districts, majority of economically active population are either involved in farming, fishery, or forestry. Table 3.3 presents the percentage of economically active population involved in various economic activities in the SRC areas.

Table 3.3: Economically Active Population Involved in Various Economic Activities

(In percent of population)

#	Economically Activity	Kavre	Dolakha	Ramechhap	Sindhuli
1	Legislators/Senior Officials/ Managers	0.4	0.2	0.0	0.1
2	Prof./SemiProf./Tech Workers	4.7	3.5	1.6	2.7
3	Adm. & Clerical Workers	1.9	1.8	0.7	2.6
4	Services Workers & Shop, Market Sales Workers	11.1	6.4	2.2	5.7
5	Farm/ Fishing/ Forestry	60.8	64.7	84.5	70.8
6	Craft and Trade Workers	9.8	10.6	4.7	6.6
7	Prod. Labor Worker	2.3	0.6	0.3	0.7
8	Other and Not Stated	9.0	12.2	6.0	10.8
9	Total	100	100	100	100

Source: CBS, 2002

(4) Religion

There are a total of seven different religions in the SRC districts. Across all the districts, majority of the population follows Hindu Religion followed by Buddhism as shown in Table 3.4. .

Table 3.4: Population in the SRC Districts by Religion

(In percent of population)

#	Religion	Kavre	Dolakha	Ramechhap	Sindhuli
1	Hindu	62.6	67.8	71.9	64.5
2	Buddhism	34.6	22.3	24.7	30.4
3	Islam	0.1	0	0	0.1
6	Christian	1.8	1.63	1.6	1
8	Others	0.9	8.3	1.2	4

Source: CBS, 2012

3.2 District-level Agriculture Sector in SRC Districts

3.2.1 District Development Plans

The DDC is the local government responsible for formulating development policies, strategies, and plan; allocating and controlling resources; and monitoring the development activities in the district. The DDC is also responsible for planning, implementing, managing, and monitoring agricultural development and extension, basic and primary education, and primary health care at the district level.

Table 3.5 shows the DDC budget. The annual budget of DDC varies from Rs.2,990 million in Sindhuli to Rs.2,349 million in Ramechhap. Infrastructure, population, and social development remain the priority sectors for investment in all four districts. Less than 5% of the total district budget is spent on agriculture, varying from 2.8% in Dolakha to 5.2% in Sindhuli.

Table 3.5: DDCs' Budget, 2013/14

	Unit	Kavre	Dolakha ²⁷	Ramechhap	Sindhuli
Infrastructure & Organization Development	Rs million	847.9	1,060.63	374.9	1,328.4
	Percent	35.2	36.5	16.0	44.4
Agriculture, Forest and Environment	Rs million	90.4	80.85	106.2	154.5
	Percent	3.8	2.8	4.5	5.2
Population and Social Development	Rs million	1,303.9	723.96	1,289.4	1,053.0
	Percent	54.2	24.9	54.9	35.2
Water Resources & Land Management	Rs million	62.9	135.9	115.6	103.8
	Percent	2.6	4.7	4.9	3.5
NGOs	Rs million	100.9	901.66	462.9	351.3
	Percent	4.2	31.1	19.7	11.7
Total	Rs million	2,406.00	2903	2,349.0	2,990.9
	Percent	100.0	100.0	100.0	100.0

Source: Compiled from District Development Plan of Respective Districts (DDC Kavre, 2013; DDC Dolakha 2013, DDC Ramechhap 2013 and DDC Sindhuli, 2013)

The DDC is expected to formulate the Periodic Plan and Annual Plan for the development of the district. The Periodic Plan of the district should include the following aspects:

²⁷ Sectoral budget breakdown of Dolakha is not available. It classified budget into DDC budget (NRs 235.2 millions), line agencies (NRs 900.9 millions), Municipality (NRs 63.3 millions) and VDCs (NRs 801.7 millions). However, data presented on table is computed based on classification on other districts.

- Geographical, economic, and natural heritages of the district;
- Possibilities of production in various sectors on account of comparative cost benefit;
- Areas comprising backward castes, tribes, and poorer people and various development works done or required to be done in such areas;
- Income-generating and skills-oriented development works for the women and children;
- Description of completed projects under various sectors and provision on the operation and maintenance;
- Various sectoral short-term and long-term development works on the basis of development possibility; and
- Plans on human resource development in various sectors to be formulated by the local people.

Although all four districts in the SRC area have formulated their First Periodic Plans, the plan has already been expired in 2006/07. Nevertheless, all four districts have prepared their District Development Plans for FY 2012/13, which is duly approved by the District Council. Table 3.6 below summarizes the priority laid by the district plans for the development of agriculture sector. The table reveals that the priority of all districts is improving the farmers' income through commercialization of the agriculture sector while supporting agricultural infrastructure development and market management.

Table 3.6: Development Priority of Agricultural Sector in SRC Districts, 2013/14

District	Agriculture	Livestock
Kavre	<ul style="list-style-type: none"> • Improve living standard of farmers through sustainable agriculture developing by transforming subsistence farming system to competitive and commercialize agricultural system • Increase production and productivity of agriculture crops 	<ul style="list-style-type: none"> • Increase income of livestock farmers by increasing, livestock production and productivity, employment opportunities and improving quality of livestock assets
Dolakha	<ul style="list-style-type: none"> • Promote commercial farming along the road corridors based on comparative advantages • Implement agricultural commercialization program in partnership with public sector, private sector and financial institutions • Promote organic farming • Promote cultivation and marketing of potato, Kiwi, Orange, Junar, Pomegranate, off-season vegetables, fruits, tea, floriculture and other cereals crops for commercialization of agricultural crops • Develop district as resource center of Pomegranate, orange, Kiwi fruits • Promote mechanization of agriculture • Promote One village One product focusing on Lokta crop 	<ul style="list-style-type: none"> • Promote, encourage and support for livestock insurance, improve livestock breeding, fattening, healthy milk production, goat rearing, animal vaccination, improved variety of fodder cultivation and awareness program • Develop district as resource center of cow, pig and goat • Export meat and meat products from the district
Ramechhap	<ul style="list-style-type: none"> • Increase income of farmers by forming and strengthening Agriculture, Forests and Environment committee in all 55 the 	<ul style="list-style-type: none"> • Motivate farmers for improved and commercialized livestock farming by providing support on

District	Agriculture	Livestock
	<p>Village Development Committees (VDCs) to implement agricultural related program of DDC, VDC and DADO such as small irrigation special program, chemical fertilizer distribution, improved seeds availability, etc.</p> <ul style="list-style-type: none"> Strengthen agriculture and forest committee formed at VDC level Promote commercialization of high value agriculture crops Improve food security and nutrition on food deficit area Promote decentralized and participatory agricultural extension program 	livestock feed, breed quality improvement and market developed
Sindhuli	<ul style="list-style-type: none"> Coordinate with the District Industry and Commerce Association for establishment of Junar processing plants under one village one product program Improve Junar transportation facility to processing center 	N/A

Source: Compiled from District Development Plan of Respective Districts (DDC Kavre, 2013; DDC Dolakha 2013, DDC Ramechhap 2013 and DDC Sindhuli, 2013)

3.2.2 District Agricultural Development Programs under DADO

Guided by district development priorities and demand from agricultural SCs and VDCs, each DADO prepared a detailed annual plan of action. Table 3.7 below summarizes the agricultural development plan of the SRC districts. It reveals that citrus (mostly sweet-Junar and mandarin-Suntara oranges) and vegetable development remain as the highly prioritized programs for commercial agricultural development in all districts.

Table 3.7: District Agricultural Development Program of DADOs in 2013/14

(Unit: Rs in '000)

Programs	Kavre	Dolakha	Ramechhap	Sindhuli
A. Commercial agriculture development (Pocket area development)				
Citrus and other fruits development	1,900	720	316	508
Commercial Vegetable production/ Off-season	1,675	1,200	479	981
Potato production	500	600	169	143
Cash/species crop development	-	1,080	460	454
Fruit orchard development	-	-	374	-
Mushroom cultivation	625	-	148	-
Coffee promotion program	141	-	-	-
Tea promotion program	211	-	-	-
Cardamom promotion program	211	-	-	-
High value agriculture production	-	840	-	-
Commercial Apiculture development program	-	1,200	-	447
Agriculture market development project	2,380	840	20	-
Fishery development	186	-	-	511
Oil Crop production program	-	-	21	-
B. Food security and nutrition program				
Integrated plant and water management	-	1,200	-	1,226
Seed self sufficiency	1,770	840	-	817
Agriculture mechanization	-	1,100	-	-
Plant protection and support service	-	1,800	17	-

Programs	Kavre	Dolakha	Ramechhap	Sindhuli
Post-harvest and lost minimization		600		
Intensive crop production program		-	946	
Sustainable agriculture management	11,643		493	
Climate smart agriculture promotion			431	
C. Poverty reduction				
Agriculture extension support service		1,920	1,479	3,078
Planning, statistic and human resource		720		
Technology dissemination and inclusive program	276			
Fruit sapling distribution				44
Income generating program				28
D. Agro-biodiversity conservation				
Agro-biodiversity conservation		820		

Note: Above program budget does not including monitoring and follow-up support program

Source: Compiled from District Development Plan of Respective Districts (DDC Kavre, 2013; DDC Dolakha 2013, DDC Ramechhap 2013 and DDC Sindhuli, 2013)

Table 3.8 presents the annual budget for the devolved agriculture sector development of DADO in the SRC area. The total budget of DADO varies from Rs.22.7 million in Ramechhap to Rs.36.5 million in Sindhuli. Less than one-fourth of the budget is spent on programs while the major portion of the budget is spent on administration, especially on salary in all districts.

Table 3.8: Annual Budget of DADO, 2013/14

(Unit: Rs in '000)

Budget	Kavre	Dolakha	Ramechhap	Sindhuli
Program	12,713	14,640	5,770	9,546
Capital expenditure	650	515	3,985	14,820
Office operations	1,903	-		1,575
Administrative (Salary and allowance)	11,040	10,000	12,936	10,592
Total	26,306	25,155	22,691	36,533

Source: Compiled from District Development Plan of Respective Districts (DDC Kavre, 2013; DDC Dolakha 2013, DDC Ramechhap 2013 and DDC Sindhuli, 2013)

Apart from the devolved agriculture extension programs, different directorates under DOA are providing direct financial support to the districts to implement different agricultural related programs. Table 3.9 presents those programs.

Table 3.9: Other Agricultural Programs

(Unit: Rs in '000)

Name of the Program	Kavre	Dolakha	Ramechhap	Sindhuli
Sericulture development program	15,386	-	-	-
Crops development program	2,152	1,113	1,108	1,049
Potato and spices development program	22,731	4,332	2,038	17,408
Horticulture Development Program	575	14,399	191	-
Fishery development program	705	-	-	255
Soil testing and improvement program	1,855	-	1,325	1,325
Cooperative farming, small irrigation and cooperative development	7,381	6,089	7,623	5,347
Plant protection program	2,850	-	-	400

Source: National Planning Commission (NPC) 2013 (Computed from Nepal Development Program, 2013/14, NPC)

3.2.3 District Livestock Development Programs under DLSO

Table 3.10 presents the district livestock extension program along with the budget for 2012/13.

Table 3.10: District Livestock Support Program of DLSO in 2012/13

(Unit: Rs in '000)

Program	Kavre	Dolakha	Ramechhap	Sindhuli
Livestock breeding program	220	620	301	89
Commercial cow, buffalo and goat pocket development and extension	745	400	440	
Livestock feed and pasture development	273	425	482	390
Livestock health program	371	521	447	300
Training and capacity development	360	355	327	54
Awareness building and sensitization related program	70	200	778	415
Partnership program	835	35	171	195
Livestock fattening program	250			
Service center improvement program	180			
Women and Dalit focus program	116		22	
Livestock based cooperative development program	200	51		
Livestock laboratory and vaccination program	226		640	29
Milk production program			75	
Local livestock breed conservation program			123	
Livestock based tourism program			256	
Livestock based market development program		100		
Other supportive program such as monitoring, publication, profile preparation, vaccination, monitoring, meeting organization etc	987	270	584	550

Source: Compiled from District Development Plan of Respective Districts (DDC Kavre, 2013; DDC Dolakha 2013, DDC Ramechhap 2013 and DDC Sindhuli, 2013)

Table 3.11 presents the annual budget for the devolved livestock sector. The total budget of DLSO varies from Rs.15.8 million in Dolakha to Rs.19.3 million in Kavre. Similar to the DADO case, less than one-fourth of the budget is spent for programs while a major portion of the budget is spent for administration, especially on salary in all districts.

Table 3.11: Annual Budget of DLSO, 2012/13

(Unit: Rs in 000)

Budget	Kavre	Dolakha	Ramechhap	Sindhuli
Program expenditure	4,883	2,976	4,646	2,022
Capital expenditure	180	350	1,460	1,800
Office operations	-	1,600	-	89
Administrative (Salary and allowance)	14,241	10,900	10,018	12,250
Total	19,254	15,826	16,214	16,162

Source: Compiled from District Development Plan of Respective Districts (DDC Kavre, 2013; DDC Dolakha 2013, DDC Ramechhap 2013 and DDC Sindhuli, 2013)

Apart from the above, DLS is also providing direct funding support to different districts for the implementation of livestock-related programs. Table 3.12 presents the direct funding to districts for the implementation of different programs.

Volume II SN1.13 presents the details of human resources and administrative structure of DLSO.

Table 3.12: Different Livestock Related Programs

(Unit: Rs.1,000)

Program	Kavre	Dolakha	Ramechhap	Sindhuli
Leasehold forest and livestock development (DLSO)	2,295	1,070	1,440	783
Livestock development services	3,849	1,149	5,574	1,167
Livestock farm	-	17,347	-	-
Livestock market development program	3,250	1,600	1,300	300
Livestock health service program	700	367	373	377

Source: NPC 2013 (Computed from Nepal Development Program, 2013/14, National Planning Commission)

3.2.4 Pocket Area Development Plans in SRC Districts

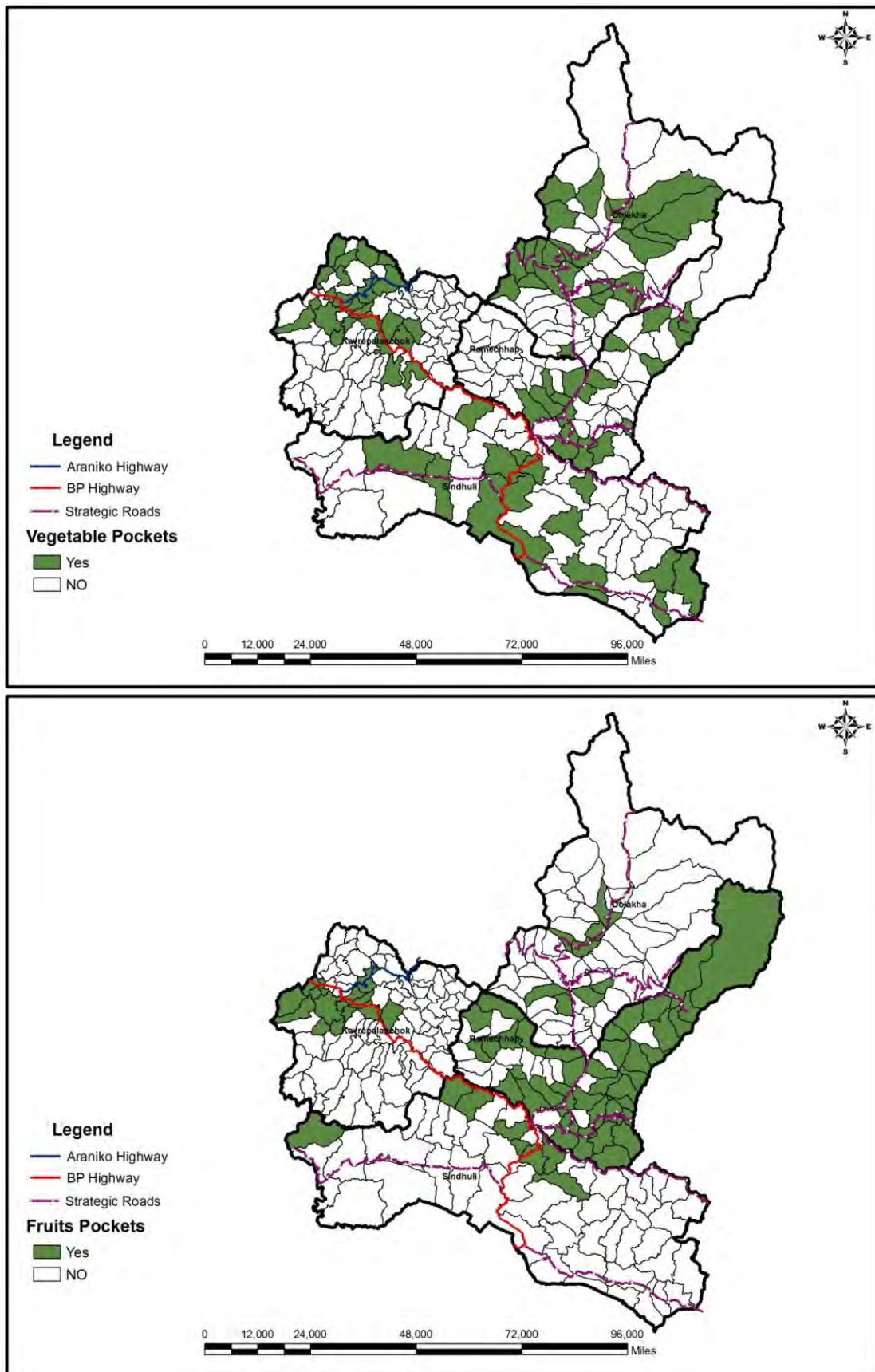
The DADO and DLSO have identified production pockets following PPS and are implementing different activities for the commercialization of agriculture. There is no specific pocket area development plan in all districts. However, they are implementing different programs at the pocket areas following participatory planning process based on demand of local communities. Map 3.1 shows the pocket area of agricultural commodities by VDCs in the study districts with details shown in Table 3.13.

Table 3.13: Production Pockets of Agricultural Commodities

District	Pocket Area	Area (ha)
Kavre	Orange and other fruits	855
	Seed Production	85
	Vegetable	725
	Food security	1,500
	High wayside Papaya cultivation	10
	Apiculture	
	Organic Vegetable farming	50
	Mushroom	4
Dolakha	Commercial vegetable	135
	Commercial fruits	100
	Cash and spice crops	35
	Commercial potato	140
	Food security	205
	High value agriculture production program	225
Sindhuli	Integrated crop and water management	8,250
	Seed sufficiency	15
	Crop rotation extension and soil improvement	100
	Ginger cultivation	175
	Seasonal vegetable production	350
	Off-seasonal vegetable production	80
	Commercial orange type fruits	624
	Potato production	70
Ramechhap	Commercial orange type fruits	230
	Commercial vegetable	160
	Potato production	1,500
	Mushroom	NA
	Intensive crop development	3,594
	Winter fruits	200
	Export promotion (Ginger, cardamom)	
	Summer fruits	55
Citrus type fruits	1,100	

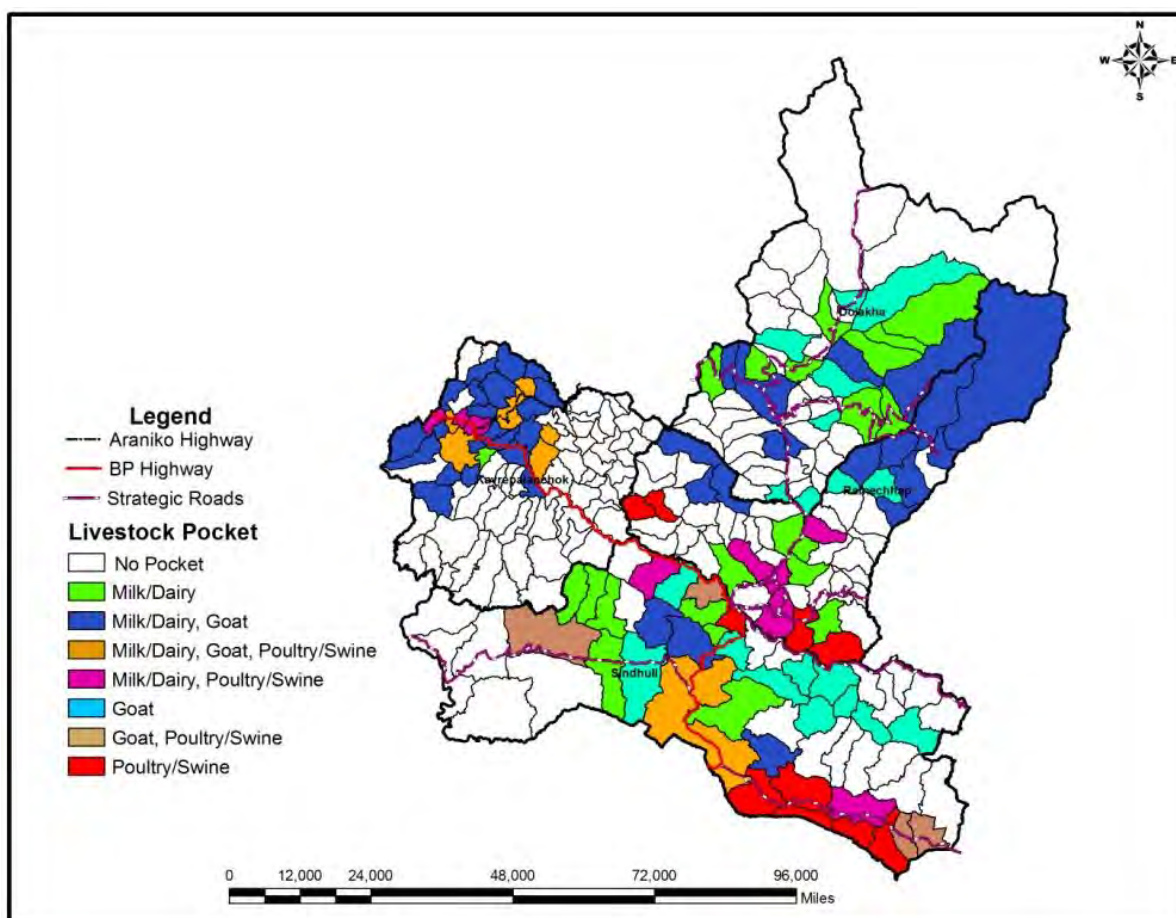
Source: Compiled from Annual Progress report of District Agriculture Development Office (DADO Kavre, 2012; DADO Dolakha 2012, DADO Ramechhap 2012 and DADO Sindhuli, 2012)

Map 3.1: Pocket Areas in Study Districts by Agriculture Commodities and VDCs



Source: Compiled from Annual Progress Report of DADO (DADO Kavre, 2012; DADO Dolakha 2012, DADO Ramechhap 2012 and DADO Sindhuli, 2012)

Map 3.2: Pocket Areas in Study Districts by Livestock Commodities and VDCs



Source: Compiled from Annual Progress Report of DADO (DADO Kavre, 2012; DADO Dolakha 2012, DADO Ramechhap 2012 and DADO Sindhuli, 2012)

3.2.5 Development Potentials of NTFP in SRC Districts

There is no NTFP specific development plan at the national level or in all study districts. The DFO is primarily responsible for the management of NTFP including issuance of permits and licenses for harvesting and transportation. Though all DFOs have prepared their five-year forest working scheme for sustainable management of forests, it remains silent on sustainable management of NTFPs.

Nevertheless, all study districts have given high priority on sustainable management of NTFP. Likewise, the Department of Forests is also providing financial support for the implementation of programs related to the management of NTFP, especially in Kavre and Dolakha districts.

Some of the major activities implemented with regard to NTFP include:

- Promotion and development of commercially viable medicinal plant species;
- Training and interactive workshops in the areas of harvesting methods, timing, etc.;
- Development of nursery as well as encourage processing of medicinal plants by providing some subsidies;
- Collection and sharing of indigenous knowledge on medicinal plants;

- Control and regulate immature and timely harvesting; and
- Assistance in the plantation of important medicinal plant (tree, shrub, and herb) species.

3.2.6 District Road Development Plan in SRC Districts

Information is summarized in the Part II Chapter 6 Zoning.

3.2.7 Development Plan of Irrigation Facilities in SRC Districts

The total irrigable land in the study districts is 37,769 ha with highest area in Sindhuli (20,652 ha) followed by Kavre (7,958 ha), Dolakha (4,911 ha), and Ramechhap (4,248 ha). Similarly, the irrigated area, i.e., area with surface irrigation facilities, is 25,914 ha in total, with highest in Sindhuli (10,898 ha), followed by Ramechhap (5,391 ha), Dolakha (5,211 ha), and Kavre (4,414 ha). A high proportion of area under Sindhuli is irrigated or irrigable because the district is rich in water resources, and many of the agricultural lands are located in the lowland, especially in Terai. Irrigated area is wide in Dolakha and Kavre districts than the irrigable area, which reveals that irrigation development has surpassed the estimated potential.

Table 3.14: Present Level of Irrigation Development in the Study Districts (2011/12)

District	Total Arable Land (ha)	Irrigable Area (ha)	Irrigated Area (ha)
Kavre	29,921	7,958	4,414
Dolakha	24,042	4,911	5,211
Ramechhap	32,276	4,248	5,391
Sindhuli	34,333	20,652	10,898
Total	120,572	37,769	25,914

Source: Computed for Statistical Information in Nepalese Agriculture, 2011/12, MOAD

There is no irrigation development plan in all study districts. However, multiple agencies, including the Irrigation Development Divisions, DADO, District Technical Offices, NGOs, are working for the development of irrigation facilities, including repair, maintenance, and rehabilitation. As each agency follows its own plans and procedures, there is virtually little or no coordination in irrigation related programs in the districts. There is no water resources allocation and development plan in all study districts either.

3.3 Agriculture Production in SRC Districts

3.3.1 Cultivated Area for Production in the SRC Districts

(1) Cultivated Land

Table 3.15 presents the area under cultivated land by study districts. Ramechhap (40,050 ha) has the highest cultivated land followed by Sindhuli (39,485 ha), Kavre (36,442 ha), and Dolakha (29,423 ha). Out of the total agricultural land, more than half of it is cultivated except in Dolakha.

Table 3.15: Arable and Cultivated Land in Study Districts

Districts	Arable Land (Ha)	Cultivated Land	
		(Ha)	Arable Land (%)
Kavre	61,599	36,442	59.2
Dolakha	44,871	29,423	65.6
Ramechhap	59,180	40,050	67.7
Sindhuli	58,846	39,485	67.1

Source: Intensive Study and Research Center, 2008

3.3.2 Tenancy and Landholding in the SRC Districts

(1) Landholding

The proportion of landless households in the study districts varied from 0.1% in Kavre and Ramechhap districts to 0.6% in Dolakha District (Table 3.16).

Table 3.16: Proportion of Households with Land in the Study Districts

Holdings	Kavre		Dolakha		Ramechhap		Sindhuli	
	No.	%	No.	%	No.	%	No.	%
Without	33	0.1	231	0.6	44	0.1	70	0.2
With	64,537	99.9	40,165	99.4	38,756	99.9	46,226	99.8
Total	64,570	100.0	40,396	100.0	38,800	100.0	46,296	100.0

Source: National Sample Census of Agriculture, Nepal, 2001/02, CBS.

Table 3.17 presents the distribution of agricultural landholdings. The National Sample Census of Agriculture showed that two-thirds of households across all the study districts own less than 1 ha of land. Very few farmers have more than 5 ha of land. These fragmented and small-size landholdings have been a challenge for increasing productivity.

Table 3.17: Distribution of Agricultural Landholding

Holding Size (ha)	Kavre		Dolakha		Ramechhap		Sindhuli	
	ha	%	ha	%	ha	%	ha	%
< 0.1	2,059	3.2	1,338	3.5	461	1.2	2,006	4.3
0.1 - 0.2	4,717	7.3	3,586	8.9	2,500	6.5	5,201	11.3
0.2 - 0.5	22,852	35.4	13,967	34.8	10,725	27.7	15,323	33.1
0.5 - 1.0	22,553	34.9	13,099	32.6	14,081	36.3	14,530	31.4
1.0 - 2.0	9,998	15.5	6,072	15.1	8,400	21.7	7,533	16.3
2.0 - 3.0	1,727	2.7	1,735	4.3	1,733	4.5	1,096	2.4
3.0 - 4.0	332	0.5	289	0.7	680	1.8	350	0.8
4.0 - 5.0	266	0.4	29	0.1	88	0.2	47	0.1
5.0 - 10.0	33	0.1	-	0.0	88	0.2	117	0.3
10.0 +	-	-	-	0.0	-	-	23	0.0
Total	64,537	100.0	40,165	100.0	38,756	100.0	46,226	100.0

Source: National Sample Census of Agriculture, Nepal, 2001/02, CBS.

(2) Land Tenure

In all the study districts, the average holding size is small and most of the lands are owned. Table 3.18 presents the land tenure status in the study districts. The National Sample Census of Agriculture showed that more than 90% of land across all study districts is owned by the owner themselves ranging from 96.5% in Dolakha to 99.5% in Ramechhap.

Table 3.18: Land Tenure Arrangement in the Study Districts

Land Tenure	Kavre		Dolakha		Ramechhap		Sindhuli	
	ha	%	ha	%	ha	%	Ha	%
Owned	42,878	97.0	26,452	96.5	32,248	99.5	29,965	98.3
Rented	1,326	3.0	930	3.4	170	0.5	309	1.0
Other	14	0.0	24	0.1	1	0.0	220	0.7
Total	44,218	100.0	27,406	100.0	32,419	100.0	30,494	100.0

Source: National Sample Census of Agriculture, Nepal, 2001/02, CBS.

3.3.3 Diversity of Crops According to Different Climate and Altitude in the SRC Districts

Table 3.19 presents the typical cropping patterns of the study districts.

Table 3.19: Typical Cropping Patterns Based on the Commercial Crops

Irrigated	Partially Irrigated	Unirrigated
Kavre		
Paddy – Potato - Vegetables		Maize – Wheat – Tori
Paddy – Potato - Potato		
Maize – Potato - Vegetables		
Paddy – Wheat - Tori		
Paddy – Wheat - Potato		
Dolakha		
Paddy – Wheat - Maize	Paddy – Wheat	Maize – Potato
Paddy – Tori/Potato - Maize	Paddy – Tori/Potato	Maize/Millet – Wheat - Barley
Paddy – W. Vegetables - Maize	Paddy – Maize	Maize – Pulses
Paddy – Fallow - Maize	Paddy – Vegetables	Potato – Wheat
Paddy – Tori/Wheat - Maize	Paddy – Fallow	Maize – Vegetables/Tori
Ramechhap		
Paddy – Vegetables - Vegetables	Maize - Potato + Peas	
Vegetables –Vegetables – Vegetables	Potato – Potato	
	Potato - Vegetables	
	Paddy – Potato	
	Maize – Potato	
	Maize + Soybean - Vegetables	
	Paddy - Wheat	
Sindhuli		
Paddy – Wheat - Maize		Maize – Millet
Paddy – Lentil - Paddy		Maize – Soybean
Paddy – Tori - Paddy		Maize – Tori
Paddy – Maize		Maize – Buckwheat

Source: Annual Reports of DADOs, 2012

As shown in Table 3.20, cereal crops dominate in all study districts. Details are explained in Volume II (SN 2.1 Table 2.44). Cereal crops occupy more than two-thirds of cropped areas in all the study districts. After cereal crops, the second major crops are cash crops followed by pulses and vegetables. Fruits are cultivated in relatively limited portion of the area in all study districts.

Table 3.20: Proportion of Cropped Area under Different Crops, 2009/2010

Crops	Kavre		Dolakha		Ramechhap		Sindhuli	
	ha	%	ha	%	ha	%	ha	%
Cereals	49,350	66.2	20,213	87.7	39,153	79.9	43,466	80.8
Cash Crops	11,632	15.6	2,810	12.2	3,591	7.3	7,253	13.5
Pulses	409	0.5	902	3.9	865	1.8	2,335	4.3
Spices	1,356	1.8	209	0.9	338	0.7	575	1.1
Citrus	1,281	1.7	470	2.0	1,618	3.3	1,758	3.3
Deciduous	487	0.7	296	1.3	453	0.9	154	0.3
Tropical	546	0.7	78	0.3	387	0.8	693	1.3
Vegetables	9,337	12.5	631	2.7	830	1.7	2,155	4.0
Coffee	130	0.2	0	-	0	-	0	-
Total	74,528	100.0	23,045	100.0	49,006	100.0	53,817	100.0

Source: Statistical Information on Nepalese Agriculture 2009/10, MOAD 2012

Maize, paddy, and wheat are the main cereal crops grown in Kavre and Dolakha, maize and finger millet in Sindhuli, and paddy and maize in Ramechhap. These crops occupy more than 40% of the cropped area. The area for vegetables varies from 1.7% in Ramechhap to 12.5% in Kavre.

3.3.4 Production Change of Agriculture and Livestock in the SRC Districts

This section summarizes the changes in production volume or numbers of agricultural and livestock commodities in the last eight years in the SRC area. The production trend in the last eight years in terms of production areas, volumes and yield of commodities are presented in Volume II (SN2.1 Tables 2.48 to 2.105 and Tables 2.110 to 2.115).

(1) Agricultural Production

Table 3.21: Changes in Production Volume of Main Commodities between 2003/04 and 2011/12

(Mt)

District	Kavre		Dolakha		Ramechhap		Sindhuli	
	2003/04	2011/12	2003/04	2011/12	2003/04	2011/12	2003/04	2011/12
Rice	46,900	31,512	7,464	9,248	17,010	30,200	16,000	32,848
Wheat	30,000	21,478	8,288	4,837	6,650	8,292	11,250	13,700
Maize	59,000	62,937	9,648	21,135	32,090	50,103	32,007	40,170
Potato	92,500	179,358	20,226	27,004	26,600	32,903	14,750	17,500
Pulses	3,425	2,895	984	901	1,014	881	2,100	2,289
Vegetables	55,959	145,606	13,000	4,946	7,784	9,395	17,875	22,248
Oilseeds ²⁸	3,000	1,950	280	260	120	296	4,718	4,904
Cardamom	22	51	17	70	4	30	1	0.84
Chili	114	3,110	75	10	49	279	78	122
Ginger	5,861	525	322	360	300	1505	2,295	5,140
Garlic	3,511	5,545	257	48	35	738	636	800
Deciduous Fruits ²⁹	2,227	2,575	1,326	1,392	1,538	2,517	1,071	685

²⁸ Mustard is major oil seed grown in Nepal.

²⁹ Deciduous fruits which are grown in Nepal include apple, pear, plum, peach, persimmon, pomegranate etc.

District	Kavre		Dolakha		Ramechhap		Sindhuli	
	2003/04	2011/12	2003/04	2011/12	2003/04	2011/12	2003/04	2011/12
Tropical Fruits ³⁰	2,861	2,787	249	445	1,685	2,968	2,465	6,567
Junar	396	619	252	617	10,220	8,167	8,040	9,737
Orange	4,447	7,587	1,056	1,767	529	3017	392	1,363

Source: Various Issues of Statistical Information on Nepalese Agriculture of 2003/04 and 2011/12, MOAD.

All four districts increased maize production in the last eight years. In Kavre District, the production of rice, wheat, pulses, and ginger seem gradually decreasing. On the contrary, the production of vegetables and potatoes are dramatically increasing i.e., vegetable production almost tripled, potato production became double, and chili production in 2011/12 was 15 times higher than that of 2003/04. In Dolakha, potato, tropical fruits, and Junar production increased but not so significantly. For some reason, vegetable production decreased to less than half. In Ramechhap, both rice and wheat production increased. Notable increases in the production of chili and ginger were seen. Production of vegetable and both deciduous and tropical fruits also increased. In Sindhuli District, vegetable production increased although it was not significantly. In comparison, the production of chili and ginger almost doubled. Tropical fruits, Junar, and orange production also increased in the last eight years.

(2) Livestock Production

Table 3.22: Changes in Production Volume of Main Livestock Commodities between 2003/04 and 2011/12

(Animals are in numbers and Milk is Mt)

District	Kavre		Dolakha		Ramechhap		Sindhuli	
	2003/04	2011/12	2003/04	2011/12	2003/04	2011/12	2003/04	2011/12
Cattle	129,467	138,750	91,269	79,170	66,871	89,847	109,893	119,560
Buffalo	89,479	150,990	38,931	50,613	50,274	75,169	53,114	62,002
Sheep	2,285	3,613	23,330	16,500	3,134	4,271	2,740	263
Goat	265,852	294,676	170,887	145,780	59,738	122,619	87,614	181,482
Poultry	660,002	1,440,228	345,224	360,352	140,324	555,803	315,286	1,440,280
Milk Total	36,383	77,517	12,759	15,515	13,132	20,058	15,407	18,105
Cow Milk	10,382	13,795	4,733	5,530	2,998	4,478	4,374	5,513
Buffalo Milk	26,001	63,722	8,026	9,985	10,134	15,580	11,033	12,592

Source: Various Issues of Statistical Information on Nepalese Agriculture of 2003/04 and 2011/12, MOAD.

In all four districts, the number of buffalo and goat produced has increased. Especially in Ramechhap and Sindhuli, the number of goat produced doubled in eight years. The number of poultry produced has quadrupled in Sindhuli, tripled in Ramechhap, and doubled in Kavre. This is due to the rapid development of the private poultry industry in Nepal. Milk production from both cow and buffalo has constantly increased as the number of animals increased in the last eight years.

³⁰ Major tropical fruits cultivated in Nepal include Mango, Banana, Papaya, pineapple, guava, coconut etc.

3.4 Post-harvest Handling in the SRC Districts

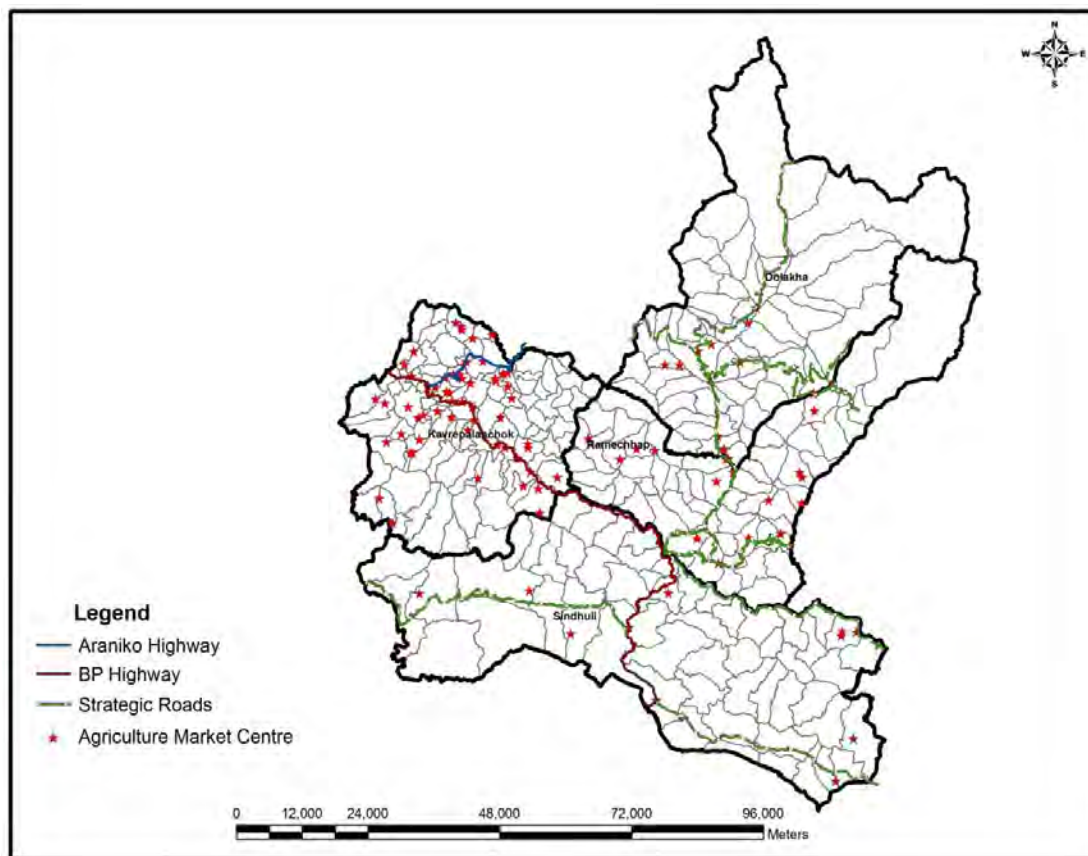
3.4.1 Processing

Post-harvest processing facilities are poorly developed in all study districts. Very few small processing plants are located for local-level fruit processing, especially for Junar.³¹ Moreover there are not known vegetable processing facilities. On the other hand, small dairy enterprises have been established for milk processing although the number is very small.

3.4.2 Market for Major Agricultural Products

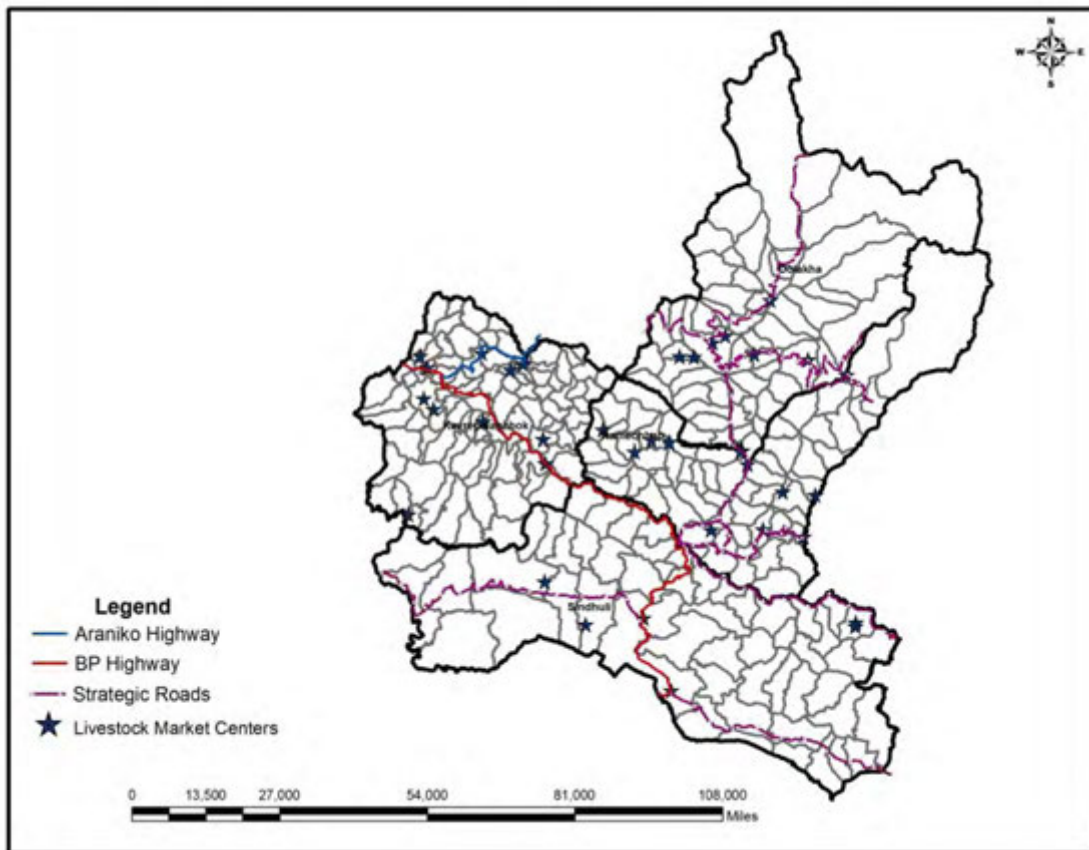
Unlike processing facilities, substantial numbers of market facilities have been identified in the SRC districts. There are a total of 90 markets identified by DADO while there are 40 markets identified by DLSO in the SRC area. Map 3.3 and Map 3.4 show the local agricultural and livestock market in the study districts, respectively.

Map 3.3: Location of Agricultural Markets in the Study Districts



³¹ Establishment of a Junar processing plant in Sindhuli is currently underway by public-private partnership modality

Map 3.4: Location of Livestock Markets in the Study Districts



In addition to the above local markets, ten market centers are identified in the SRC area as listed below. Map 3.5 presents the location of these market centers. The key features of the above ten markets are summarized in Volume II (SN 2.1 Tables 2.108 and 2.109).

- Agriculture Produce Market Center, Charikot, Dolakha
- Agriculture Produce Market Center, Jiri, Dolakha
- Haat Bazaar, Ramechhap
- Agriculture Produce Market Center, Kavre
- Agriculture Produce Market Center, Sindhuli
- Agriculture Produce Market Center, Bardibas
- Fruits and Vegetable Market, Dhalkebar
- Fruits and Vegetable Market, Naya Buspark, Hetauda
- Kalimati Fruits and Vegetable Wholesale Market, Kalimati
- Valley Fruits and Vegetable Market, Naya Baneshwor, Kathmandu

Map 3.5: Location of Studied Market Center



3.5 Key Players in Agricultural Value Chains in the SRC Districts

3.5.1 Institutional Arrangement of Agricultural Development in District Level

While DADO and DLSO are the central players for agricultural development in the district level, they are not the sole authorities. There are many other players from public (government), semi-government, non-government, and private sectors involved in the different activities of the agriculture sector at the district level as summarized in Table 3.23.

Table 3.23: Players for Different Components of Agriculture-related Activities in District Level

#	Organization	Type	Key Functions	Central Organization
1	DDC	Autonomous local government/bodies	Overall responsibility, Coordination, Supervision, Monitoring etc.	GON
2	DADO	Government	Crops, Cash Crops, Horticulture, Fisheries Development. Small scale farmer managed irrigation	DOA/MOAD
3	DLSO	Government	Livestock Dev. Veterinary Services	DLS/MOAD
4	District Agriculture Development Committee (DADC)	Government - public - private	Coordination among different key players	GON and DOA/MOAD
5	Division Irrigation Office	Government	Irrigation	Department of Irrigation (DOI) / Ministry of Water Resources (MWR)
6	ADB Branch/District Office	Public Limited	Agricultural credit	Central Office
7	Agriculture and Microfinance Banks	Private	Agriculture and microfinance	Central Offices
8	Agriculture Inputs Company Ltd/Branch Office	Public company	Distribution of chemical fertilizers	Central Office
9	Agro-vets	Private trader	Supply of agro and veterinary chemicals and seeds	-
10	Fertilizer dealers	Private trader	Sale/supply chemical fertilizers	-
11	Saving and credit cooperatives	Cooperatives	Agriculture credits	-
12	Producers' Group (Agriculture/Farmers Cooperatives, Farmer Groups)	Cooperatives	Supply of agro and veterinary chemicals, fertilizer, seeds, and procure agriculture produces	-
13	Subject-specific cooperatives such as Dairy Cooperatives	Cooperatives	Purchase fresh milk and milk products from members	-
14	Producers' associations such as Junar Central Cooperative Union Ltd. in Sindhuli and Ramechhap	Private	Technical support and backstopping in the production and marketing of concerned products and marketing services	-
15	District Chamber of Commerce and Industry (DCCI)	Private	Coordinating and networking of private firms	FNCCI and AEC
16	NGOs- International, National, District and Community Based	NGO/CBO	Income generating activities, social mobilization, technical services etc	NGO Federation

Source: Communications with stakeholders of respective districts

3.5.2 Public Sector

(1) District Agriculture Development Office

The main objective of DADO is to increase agricultural productivity and income through extension of improved technologies on various crops and thereby raising the living standards of farmers. It intends to transform traditional farming into a modern scientific practice by giving access on improved technologies, improved seeds, and chemical fertilizer to the farmers to increase crop productivity and create employment opportunities. Main functions of DADO include:

- Improve production and productivity of agricultural crops through the dissemination of appropriate technology and agricultural extension services;
- Make district food self-sufficient on food crops along with reducing import and promoting cultivation of export-oriented high value crops;
- Facilitate the commercialization of agriculture by providing support on the production of raw materials required for agro-based industries along with its establishment of and creating employment opportunities at the local level;
- Promote the cultivation of export-oriented high value crops for the improvement of living standard of farmers;
- Facilitate the easy access of production inputs for agriculture such as seeds, pesticides, and fertilizers in required quantity as well as ensure the quality supply;
- Support the dissemination of agricultural technology and provide feedback to research station on agricultural research; and
- Support the sustainable agricultural development in the district considering geographical diversity and environmental conditions.

Table 3.24: Human Resources of DADO in SRC area

(Unit: Person)

No .	Position	Responsibility	Kavre	Dolakha	Ramechhap	Sindhuli	Total
1	District Agriculture Development Officer	Chief	1	1	1	1	4
2	Agriculture Extension Officer	Agri. Extension	1	1	1	1	4
3	Horticulture officer	Horticulturist	1	1	1	1	4
4	Crop protection Officer	Plant Protection	1	1	1	1	4
5	Planning Officer	Argi. Economist	1	0	1	1	3
6	Junior Technician (JT)	Agri. Extension	4	3	4	4	15
7	Junior Technician (JT)	Agri. Economist	3	2	2	2	9
8	Junior Technician (JT)	Plant Protection	2	1	2	1	6
9	Junior Technician (JT)	Horticulturist	2	2	2	2	8
10	Junior Technician (JT)	Crop Develop.	1	0	0	1	2
11	Junior Technical Assistant (JTA)	Agri. Extension	5	2	5	6	18
12	Junior Technical Assistant (JTA)	Agri. Economist	4	1	3	2	10
13	Junior Technical Assistant (JTA)	Horticulturist	2	2	2	2	8
14	Junior Technical Assistant (JTA)	Crop Develop.	1	1	2	2	6
15	Junior Technical Assistant (JTA)	Plant Protection	3	2	1	2	8
16	Junior Technical Assistant (JTA)	Soil	1	0	1	0	2
17	Mechanical Engineering	Vehicle Driver	1	0	0	1	2
18	Typist	Typist	1	0	0	0	1
19	Administrative assistant	Administration	1	1	1	1	4
20	Account assistant	Accounting	1	1	1	1	4
21	Office assistant	Helping in office	17	11	15	15	58
	Total		54	33	46	47	180
	of which Technical Staff		33	20	29	29	111
	of which JT/JTA		28	16	24	24	92
	Related Information						
	- No. of ASC		6	5	6	9	26
	- No. of CP		0	0	1	3	4
	- No. of VDC		87	51	55	53	246

Source: DOA as 2012 data

(2) District Livestock Office Service Office

The objective of DLSO is to increase the production of livestock products by diversifying and commercializing livestock activities at the district level and by making livestock income-oriented and a respectable occupation. Main functions of DLSO include: 1) providing animal health treatment facilities to the district; 2) improving the quality of local breeds; 3) promoting cultivation of different grasses and fodder and management of pasture; 4) increasing production and productivity of livestock; 5) providing support services to promote private sector participation on delivery of livestock health related services; 6) building capacity of farmers; and 7) increase income and employment opportunities to farmers.

Table 3.25: Human Resources of DLSO in Study area

(Unit: Person)

No.	Position	Responsibility	Kavre	Dolakha	Ramechhap	Sindhuli	Total
1	Veterinary /Senior Livestock Dev. Officer	Chief	1	1	1	1	4
2	Livestock Development Officer	Deputy	2	1	1	1	5
3	Junior Technician (JT)	Livestock dev.	3	3	2	3	11
4	JT	Livestock treat.	4	4	3	4	15
5	Joiner Technical Assistant (JTA)	Livestock dev.	7	7	7	5	26
6	JTA	Livestock treat.	12	10	8	12	42
7	Administrative assistant	Administration	1	1	1	1	4
8	Account assistant	Accounting	1	1	1	1	4
9	Driver (contract basis appointment)	Driver	1	1	0	1	3
10	Typist	Typist	1	0	0	0	1
11	Office assistant	Helping in office	21	14	14	16	65
	Total		54	43	38	45	180
	of which Technical Staff		29	26	22	26	103
	of which JT/JTA		26	24	20	24	94
	Related information						
	- No. of ASC		8	6	4	6	24
	- No. of ASSC		13	8	8	7	36
	- No. of VDC		87	51	55	53	246

Source: DOL as 2012 data

(3) DADO and DLSO Extension Services

At the district level, agricultural and livestock services are provided by the government staff assigned to DADO and DLSO. Field staff members (JT/JTAs) are posted at SCs and SSCs from where they deliver services and provide some technical demonstrations to farmers. DADO and DLSO have three SCs and a few SSCs in each district. Detailed information on the extension system in Nepal is summarized in Volume II SN1.8.

Table 3.26: Comparison of Numbers of JT/JTA to Farmer Household in the Study Districts

No.	Particular	Unit	Kavre	Dolakha	Ramechhap	Sindhuli	Total or Average
1	No. of Household*	No.	86,605	48,414	45,036	58,270	238,325
2	No. of Farm Household (FHH)**	No.	73,614	41,152	38,281	49,530	202,577
3	No. of DADO's JT/JTA***	Person	28	16	24	24	92
4	No. of FHH per DADO's JT/JTA	No.	2,629	2,572	1,595	2,064	2,202
5	No. of DLISO's JT/JTA****	Person	26	24	20	24	94
6	No. of FHH per DADO's JT/JTA	No.	2,831	1,715	1,914	2,064	2,155

Source: *, CBS, 2011, **, Assumed that 85percent of households are FHH, ***, DADO, 2012, ****, DLISO, 2012

The extension services of DADO/DLISO face serious challenges, and are weak in general. In particular, the following points need to be addressed for the promotion of agricultural commercialization in the SRC area:

1) Limited Human Resources (Numbers)

The total number of agricultural and livestock extension workers (JT/JTA) in the four districts is 94 and 92, respectively. On the other hand, the total number of farmers in the four districts is about 202,600 households. In calculation, the average number of farmers that one agricultural or livestock JT/JTA is supposed to look after is about 2,200 households (Table 3.26). Usually, JT/JTAs provide extension services to a group of farmers. Assuming that there are 30 farmers in a group, a JT/JTA has to visit a farmer group five times a year, then the JT/JTA has to work 367 days a year (2,200/30x5). Given the work of gathering and reporting information in order to contribute to the policy making and management of agricultural production in the area at the same time, giving enough extension services to all target farmers or farmers' groups is physically impossible.

In particular, when it comes to the HVCs, there are only 16 JT/JTAs who specialized in horticulture in the four districts. Assuming that even only 25% of the farmers need help for production of HVCs, in the same manner, one JT/JTA has to look after 3,300 farmers; therefore, it is impossible for JT/JTAs to meet farmers' needs.

2) Difficulty in Movement

The construction of Sindhuli Road is nearing its completion, but local roads leading to it are generally not in good condition, and traveling to the site requires a lot of time for JT/JTAs. For example, the average time required to reach the four SRCAMP pilot sites in dry season is more than one hour each way by bus with walking for JT/JTAs. In this situation, it is very difficult for JT/JTAs to provide extension services to farmers. In addition, travel expenses and daily allowance are not secured enough under the DADO/DLISO budget. This is the major restraining factor for JT/JTAs extension efforts.

3) Limited Capacity (Technical)

The JTAs are trained at the Technical School for either 15 months or 29 months including a few

months for OJT period, depending on their secondary education level or/and if they have passed the JTA exam. Their training period is rather short to master high level technical skills and knowledge. Even JTs who have more experiences or qualifications and may have enough information and experience on paddy or maize production, it is most unlikely that they can fully respond to the needs for HVC production, marketing, and trading. In particular, they are not capable of providing services when it comes to the activities for promotion of agricultural commercialization, including mobilization of farmers and establishment of cooperatives, management of farmer groups or cooperatives, introduction of unified production, market information gathering or provision, and collection center management.

(4) District Agriculture Development Committee

Table 3.23 in the previous section reveals that agricultural development is a multi-sector activity and that it is not the sole responsibility of the government. For facilitating the coordination among the different agencies, avoiding duplications, establishing harmony among the different agencies and providing technical backstopping, the GON has formed a DADC in each of the 75 districts to be chaired by the chairperson of the DDC.

The DADC was formed in early 2001, replacing the District Agricultural Implementation Committee, to coordinate, plan, monitor, and evaluate APP-related agricultural programs. APP expected the integrated implementation of programs to have synergistic effect in the outputs. The committee comprised 21 members (in Volume II SN 2.1, Table 2.118) representing APP-related government line agencies, semi-government organizations, NGOs, private entrepreneurs, and farmers (male and female). The DDC Chairman is the ex-officio chairman, and DADO works as the member secretary.

The DADO is given a lead role in coordinating APP stakeholders in the delivery of intended inputs. DADC members have taken DADC as a forum to communicate about each other's program, coordinate between APP-related agencies, and take decision in timely manner to solve minor problems emerging in the field. However, to date, DADC, in general, has not been able to carry out a sound coordination that would generate a synergy in the agricultural production and livelihood of poor and disadvantaged farmers.

3.5.3 Producers' Groups

(1) Cooperatives

One common characteristic of all four districts is the limited number of vegetable and fruit farmers' cooperatives involved in HVC production.

As shown in Table 3.27, Kavre District has the highest number of registered cooperatives among the four study districts. It has three times more than that of Ramechhap, which has the lowest number of cooperatives. The number of registered agriculture related cooperatives is also highest in Kavre. In Ramechhap and Sindhuli, the number of registered cooperatives is relatively low. However, it is difficult to assess the activeness of these cooperatives due to lack of sufficient information.

Table 3.27: Details of Cooperatives in the Study Districts

	Kavre	Dolakha	Ramechhap	Sindhuli
Saving and credit cooperatives	461	208	185	123
Agriculture Cooperatives ³²	146	133	82	88
Vegetable and Fruit Producers' Cooperatives	19	6	11	7
Tea Producers' Cooperatives	0	2	1	0
Milk Producers' Cooperatives	272	7	4	17
Multipurpose Cooperatives	184	38	34	21
Coffee cooperatives	8	-	-	1
Junar cooperatives	0	-	-	31
Other Cooperatives	54	58	20	64
Total cooperatives	1,144	452	337	352
No. of agriculture related cooperatives	445	148	98	144

Source: DOC Statistics 2012

(2) Farmer Groups

All four study districts share a common trend on the agriculture-related farmer groups. The cereal crop and vegetable farmer groups are the majority, excluding multipurpose and integrated pest management groups. In light of livestock farmer groups, goat and buffalo groups account for over half of all livestock groups except in Kavre. Table 3.28 shows the details of farmer groups in the study districts. It should be noted that the capacity of these groups may vary among districts; therefore, it may be difficult to capture the reality of farmer groups based solely on their numbers in the study districts.

Table 3.28: Numbers of Farmers Groups in the Study Districts

District	Category of Farmer Groups	No.	Total No.
Kavre	Agriculture/Farmer Groups	262	599
	Livestock Groups	337	
Dolakha	Agriculture/Farmer Groups	268	456
	Livestock Groups	188	
Ramechhap	Agriculture/Farmer Groups	129	240
	Livestock Groups	111	
Sindhuli	Agriculture/Farmer Groups	161	347
	Livestock Groups	186	

Source: DADO and DLSO District Profiles 2009/10 of Kavre, Dolakha, Ramechhap and Sindhuli districts

(3) Community Forestry User Groups

Table 3.29 presents the details of CFUGs in the study districts.

³² Vegetable and Fruits Producers' Cooperatives handles HVCs, while Agriculture Cooperatives handles crops in general and agricultural inputs.

Table 3.29: Details of Community Forestry User Group in the Study Districts

District	No of CFUGs	Forest Area (ha)	HHs (No)	Forest Area/HH (ha)
Kavre	411	18,995.22	36,097	0.53
Dolakha	280	29,901.43	41,229	0.73
Ramechhap	339	26,861.88	39,546	0.68
Sindhuli	406	685,12	42,333	1.62
Total	1,436	144,270	159,205	0.91

Source: CFUG Database, DOF, GON as of October 20, 2013

3.5.4 Agricultural and Microfinance Services in SRC Districts

Three types of institutions are providing microfinance services in the study districts. They include 1) micro-credit bank, 2) cooperatives, and 3) financial NGOs. Tables 3.30, 3.31, and 3.32 present the list of micro-credit banks, cooperatives, and financial NGOs providing microfinance services. The detailed information for status of activities performed by these organizations, in terms of coverage of number of groups, persons, loan disbursement and repayment, etc., are not available.

Table 3.30: List of Micro-credit Development Banks Functional in the SRC Districts

	Name of Institution	Kavre	Dolakha	Ramechhap	Sindhuli
1	Madhymanchall Grameen Bikas Bank Ltd.	✓			
2	Rural Microfinance Development Center Ltd.	✓	✓	✓	✓
3	Deprosc Microfinance Development Bank Ltd	✓	✓	✓	✓
4	Chhimek Microfinance Development Bank Ltd	✓			✓
5	Shawalamban Laghu Bitta Bikas Banks Ltd.	✓			✓
6	Sana Kisan Vikas Bank Ltd.	✓	✓		
7	Naya Nepal Laghu Bitta Bikas Bank Ltd.	✓		✓	✓
8	Sworojagar Laghu Bitta Bikas Bank Ltd	✓			
9	First Microfinance Development Bank Ltd	✓	✓		
10	Mirmire Microfinance Development Bank Ltd.	✓	✓		

Source: NRB, 2011

Table 3.31: List of Saving and Credit Cooperatives with Limited Banking Authority Registered under NRB Operating in the SRC Districts

Names	Operation Started Date	Head Office	Paid up Capital (Rs. '000)
Bindabasini Saving & Credit Co-operative Society Ltd.	6/21/1995	Khopasi, Kavre	411
Shree Manakamanal Sahakari Sanstha Ltd.	2/18/1997	Banepa, Kavre	120

Source: NRB, 2011

Table 3.32: List of NGOs Providing Financial Services with NRB License Functional in the SRC Districts

	Names	Kavre	Dolakha	Ramechhap	Sindhuli
1	Mahuli Samudyik Bikas Kendra				✓
2	MANUSHI		✓		
3	Jiwan Bikash Society				✓
4	Nepal Mahila Utthan Kendra	✓	✓	✓	
5	Gramin Mahila Utsukta Bikas Manch				✓
6	Sawabalamban Bikash Kendra	✓			

Source: NRB, 2011

3.5.5 Input and Service Suppliers in the SRC Area

Input suppliers include fertilizer sellers, pesticide sellers, cooperatives, and agro-vets. Kavre District has the highest number of input suppliers with 72 registered pesticide sellers, 139 fertilizer sellers, and 69 agro-vets. These agents have been providing key inputs such as medicines, micro-nutrients, and vaccines to farmers. Refer to Table 3.33 for details of the input suppliers in the study districts. Information about other business suppliers in the SRC area is summarized in Tables 2.118 and 2.119 in Volume II (SN 2.1 Tables 2.126 and 2.127).

Table 3.33: Number of Input Suppliers in the Study Districts

	Category	Kavre	Dolakha	Ramechhap	Sindhuli
1	Registered pesticide sellers	72	36	36	16
2	Registered fertilizer sellers	139	95	51	18
3	Cooperative shops registered under DADO	NA	69	54	42
4	Agro-vets	69	36	49	23

Source: Computed from Annual Progress Report of DADO, 2010 and 2012 of respective districts

<Agro-vets >

Agro-vets are small retail stores selling agricultural inputs and products, including fertilizers, pesticides, seeds, small equipment, feeds, and medicines for livestock to general farmers. They not only sell products but also often provide technical advices to farmers. Their knowledge and technical capacity are unknown, nevertheless they are important resources for farmers, especially those who receive little extension services from the government.

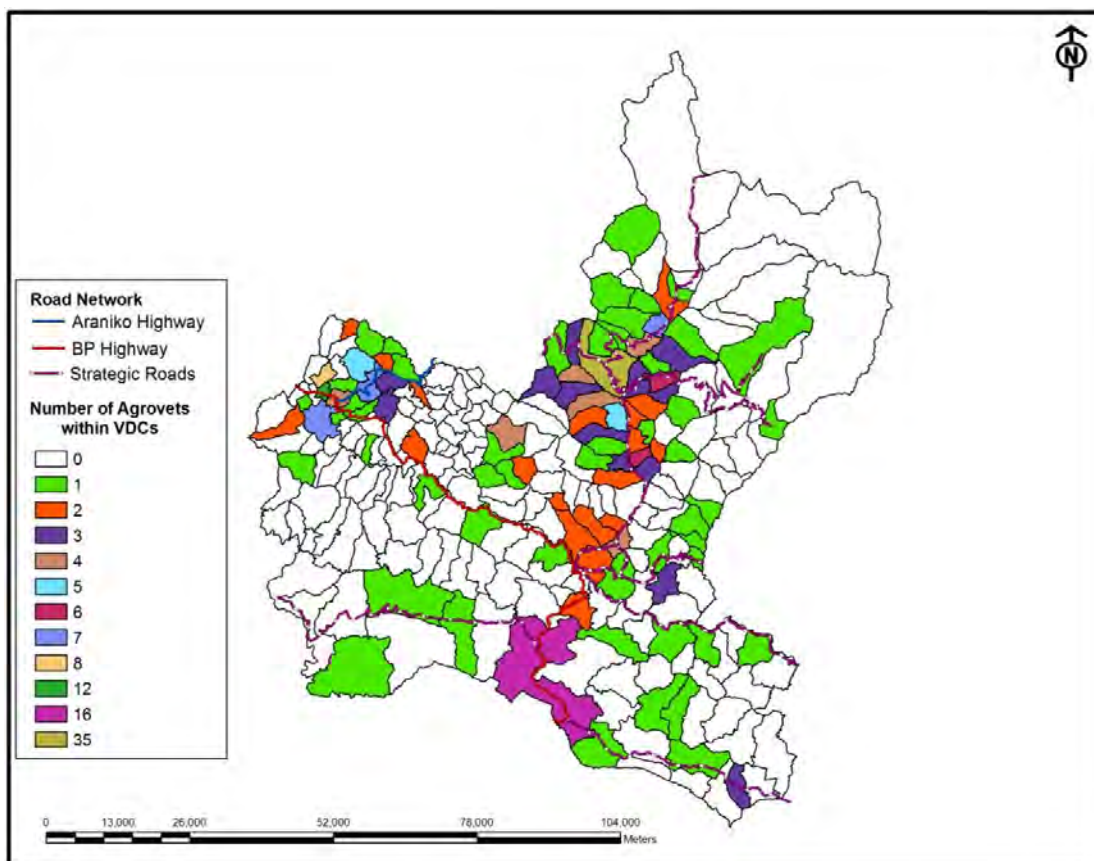
Table 3.34 presents the number of agriculture and livestock-related agro-vets in the study districts. Likewise, Map 3.6 and Map 3.7 present the number of agriculture agro-vets (fertilizer and pesticide sellers) and livestock agro-vets (livestock feeds and medicine sellers) operating in the study districts.

Table 3.34: Number of Agriculture and Livestock Related Agro-vets Operating in the District

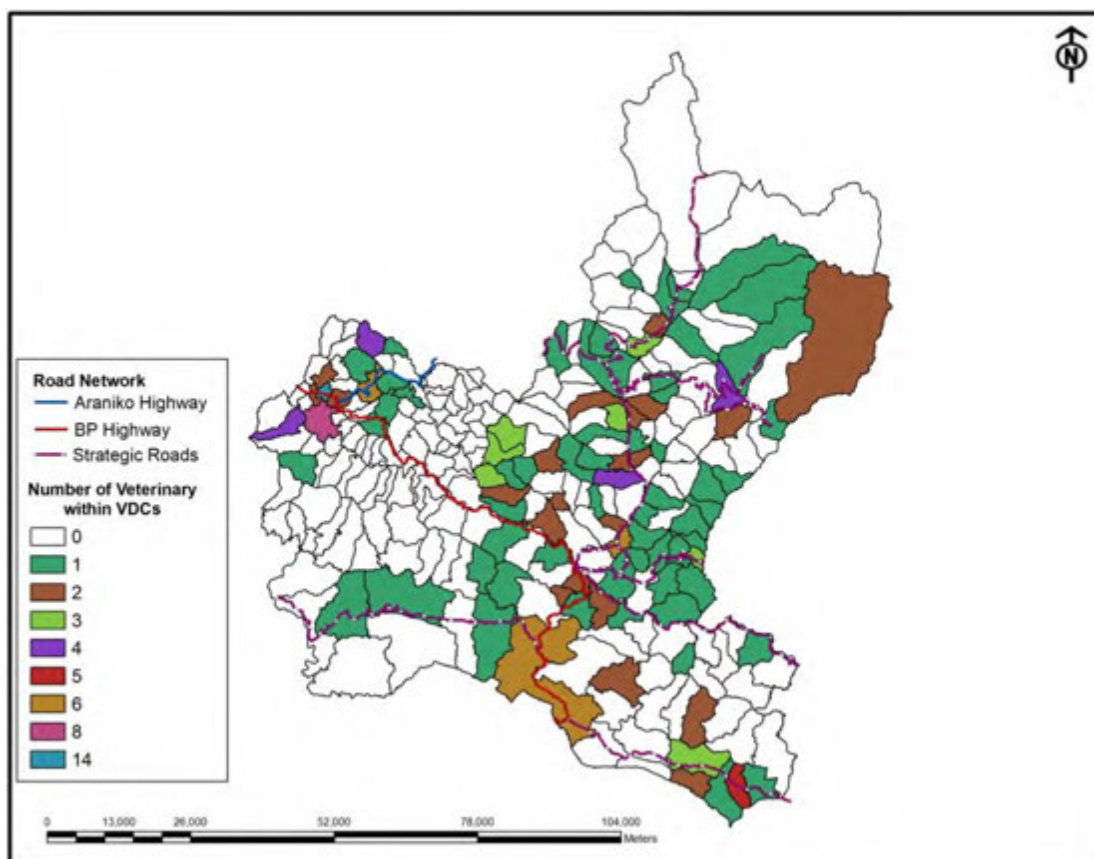
District	Agriculture related Agro-vets	Livestock related Agro-vets
Kavre	70	49
Dolakha	125	38
Ramechhap	36	57
Sindhuli	34	39
Total	265	183

Source: Computed from Annual progress Report of DLSO, 2011/12 of respective districts (DLSO Kavre, 2011, DLSO Dolakha 2011, DLSO Sindhuli 2011 and DLSO Ramechhap, 2011)

Map 3.6: Number of Agriculture-related Agro-vets in the Study Districts



Map 3.7: Number of Livestock-related Agro-vets in the Study Districts



3.5.6 Traders of Agricultural and Livestock Products Produced in the SRC Area

Details on traders (agriculture and livestock products) are not available in the study districts because there is no system that registers them and monitors their businesses. Some traders are members in DCCI, which is the district chapter of FNCCI. However, DCCI only keeps demographic details of their members and the date of renewal of their membership status. According to DCCIs, most of the traders handle multiple commodities and it is impossible for them to keep the details of their businesses. Most of the producers and traders make personal communications; therefore, getting district level information on the local, national, and international traders from the study districts was impossible.

3.5.7 Market Price Information Service for Producers

There are four major organizations compiling and publishing market price information for farmers in the area i.e., NRB, AEC of the FNCCI, respective marketing directorates of DOA and DLS, and Kalimati Wholesale Market in Kathmandu. Table 3.35 below lists the present market price information systems.

Table 3.35: Market Price Information System for Producers

Responsible Agency	Purpose	Information source	Frequency	Available for Producers
NRB	Estimation of consumer price index	21 urban centers for the CPI Retail prices of consumer goods	Weekly	No
Agriculture Business Promotion and Market Promotion Directorate (ABPMD) and Livestock Market Promotion Directorate	Retail Prices of agricultural commodities	DOA and DLS Collection Centers, DADO/DLSOs, Weekly Markets, particularly in urban centers	Fortnightly	Reports published through special issue of Agricultural Marketing Information Bulletin, but hardly reaches to producers
AEC of FNCCI	Retail Prices of 311 selected vegetables and other key agricultural commodities from 31 districts and India	Selected Markets throughout the country, particularly in urban centers	Daily	Published in the AEC website (www.agripricenepal.com) and posted in markets
Kathmandu Fruit and Vegetable Markets	Wholesale and retail prices of selected fruits and vegetables	Kalimati Market Center	Daily	Available through telephone, internet and scrolling news in selected TV channels

As seen from the above table, daily and reliable market price information hardly reaches the producers. Therefore, they will need to use their own informal sources and channels to update themselves about the market prices of the different products they handle through telephones, particularly mobile phones, other producers, and businesses/traders.

3.5.8 Donor Agencies in the SRC area

Some donor agencies and NGOs are active in the SRC including ADB, WB, IFAD, SDC, USAID, and Plan Nepal.

(1) Asian Development Bank

ADB is the largest donor that provides assistance in agriculture sector in Nepal: 28% of its total lending to Nepal is allocated to the agriculture sector, which is USD 788.89 million³³. Agriculture and natural resources is one of the ADB's six priority areas of Nepal. In particular, it supports rural infrastructure development, irrigation development, agricultural research and development, income-generation of the outpost, IT technology, extension services, and market support, in order to contribute to the improvement of agricultural productivity and food security³⁴.

As for ADB's assistance relating to agricultural commercialization, there is the "Commercial Agriculture Development Project (CADP)" being implemented in the eastern part of Nepal. It is a pioneer of its kind. Those projects supported by the WB and IFAD seem to have made a model on the approach of CADP. CADP is scheduled to end in 2013, but other projects including RISMF and HIMALI where Dolakha District is under its coverage, were designed by applying the similar approach of CADP with some modifications.

The basic concept in designing agricultural commercialization projects including CADP is "to produce in order to meet the market demand, and if there are constraints and issues, including policies and regulatory aspects, there is a need to make various interventions". As for the regulatory framework, first the "alliance of commercial actors" - a group of value chain actors is organized, and then the groups discuss, identify, and agree with the gaps in the value chain. ADB provides fund to the group, based on their proposals, to address those issues, which include procuring infrastructure, equipment, or technical assistance, etc.

It also assists developing small-scale infrastructure around the rural road under the "Rural Reconstruction and Rehabilitation Sector Development Project". The following all season passable roads were constructed in 2012: 1) connection between Ratanchura VDC and the highest part of the Sindhuli Road and 2) connection between Sukani and Campa, Bhirkot and Hawa, and Namdu and Chhap in Dolakha District. DOLIDAR is the executing agency of the project.

As for the irrigation sector, the "Community-Managed Irrigated Agricultural Sector Project" (USD 20 million loans) supports the construction and repair of farmer managed small-scale irrigation systems and strengthening the water users associations that may be turned into multipurpose cooperatives. This project covers all four study districts. In Kavre District, two schemes were constructed and one was under construction in 2012.

³³ ADB & Nepal: Fact Sheet 2012, ADB

³⁴ Country Partnership Strategy

(2) World Bank

The WB has committed to Nepal a financial assistance amounting to a total of USD 401 million in 2013. In agriculture sector, WB focuses on agricultural commercialization and efficiency of irrigation systems. Especially, it considers the improvement of irrigation schemes is essential for increase agricultural productivity. In that sense, WB will continuously support farmers to manage community-based small irrigation systems through currently implemented two projects, namely, PACT and Irrigation and Water Resource Management Project. While the recent WB project extended in the SRC area entitled Poverty Alleviation Fund Project II ended in 2012, PACT has started its operation in all four districts in the SRC area from end of 2013.

(3) International Fund for Agricultural Development

IFAD recognizes that building sustainable livelihood and rural institutions require extended support. Its interventions are designed to: 1) stimulate income diversification and productive employment by promoting a range of economic opportunities; 2) unleash investment by poor rural people in market-oriented activities, reducing their vulnerability to climate and other shocks; and 3) strengthen rural institutions, enabling them to deliver effective, accountable, and climate-smart services to on- and off-farm producers on an equitable and sustainable basis.

IFAD directs its resources towards the hill and mountain areas, where poverty levels are high and access to infrastructure, services, and markets is extremely limited. In the SRC area, IFAD is implementing the “Leasehold Forestry and Livestock Program”. In the program, all four study districts are included as target districts. The project tries to increase farmers’ income from forest products and livestock by supporting household forage and tree crop production, household production of livestock, especially goats, access to microfinance services, and government's capacity to implement leasehold forestry.

(4) European Commission

The EC has recently started a program named *UNNATI* (means “wealth” in Nepali) – Inclusive Growth Program in Nepal. Within the SRC districts, six VDCs located along the Sindhuli Road in Sindhuli District are included as the target by the Center for Environmental and Agricultural Policy Research, Extension and Development (CEAPRED)³⁵. A local NGO consigned the task from EC via CARE Nepal. This project includes the various activities related to the vegetable value chain strengthening.

(5) Swiss Development Cooperation

The SDC has been the most active bilateral donor in the SRC area in terms of agriculture related field. SDC’s focus on assistance has been on the production side, but will to be shifted to the processing and marketing side in the future. In cooperation with the Swiss NGO, Helvetas, they are active in their target areas: Dolakha, Ramechhap, Okhaludhunga, and Khotang in the Central Region, and Dailekh,

³⁵ Center for Environmental and Agricultural Policy Research, Extension and Development

Achham, Jajarkot, and Karikot in the Western Region. About 40% of its total budget to Nepal is allocated for the activities in this region.

SDC has continued its assistance in the target area for a long time, supporting the multi-sector regional development. In the study area, SDC has been active in Dolakha for over 40 years. They have much accumulated know-how and experiences in the district. However, they are phasing out its cooperation from Dolakha and move their focus to Ramechhap District. In fact, they have already been working with seven VDCs, including Kimuti VDC, in Ramechhap for around five years. SDC also helped Ramechhap DDC to identify the five-year development plan.

Not only their target area, but its approach will also change. Much focus is placed on the poor population in the remote area, but more attention will be given to the farmers who live near the accessible road-side where economic opportunity is relatively high. This is similar to SRCAMP approach.

Three pillars of its cooperation are as follows: 1) agriculture, including small irrigation and natural resources management; 2) rural road; and 3) skill development. As for agricultural sector development, SDC has had good outcome from its cooperation, including quality seed production. However, they will work around the value chain, especially giving attention to post-harvest processing in the future.

(6) United States Agency for International Development

The USAID has given attention to agricultural research and adoption of new techniques that come out of it. It believes that these activities are essential elements for improving agricultural productivity and promotion of HVCs. It has revealed plans to continue its support in agricultural development and food security as well as commitment in the expansion of farmers' opportunities in the future.

In the SRC area, it implemented the Nepal Economic Agriculture Trade (NEAT) Project between 2011 and 2013 in some VDCs in Kavre District. The activities conducted in NEAT are as follows: 1) training of farmers regarding production of 13 horticultural crops and three livestock; 2) building linkage between farmers and domestic and foreign markets, including construction of collection centers and export promotion (tea, ginger, and lentil); and 3) improving flow and quality of inputs.

USAID conducts other market-oriented agricultural projects in other areas in Nepal. However, lessons from their approach, including public-private partnership that is employed in SRCAMP pilot projects, can be drawn and incorporated in the cooperation to the SRC area.

(7) Plan Nepal

Plan Nepal has been active in Sindhuli District over the past two years. They are currently implementing the "Adolescent Girls Empowerment Project". The goal of the project is to economically and socially empower women under 24 years old. For the economic empowerment, women are organized into savings and credit cooperatives, and income generating activities are conducted. In agricultural related activities, the groups will particularly produce vegetables and milk. About 24 cooperatives in 12 VDCs have been established in Sindhuli District.

Activities in vegetable production include the establishment and management training of agro-vets,

development of leading farmers, construction of micro-irrigation systems, setting up of collection centers, and production of seeds. For the milk production, development of village animal health workers, service provision through agro-vets, and provision of artificial insemination (AI) services are included as activities. There are similarities between Plan Nepal's activities and SRCAMP concept. Through good coordination and cooperation, synergistic effect could be expected in both assistances in Sindhuli District.

(8) Local NGOs

In Nepal, more than 40,000 NGOs exist under the NGO coalition. Out of these, those who are registered with the District Administration Office are called district level NGOs or known as D-NGOs, and they are distinguished from the national-level NGOs (N-NGOs) that are registered with the Central Social Welfare Council. Most of the D-NGOs are Community Forest Users' Associations or Water Users' Associations (WUAs), and very few NGOs are capable of working under the contract with the central or local governments and donor agencies. They play an important role in the district development, but they are often small and dependent on individual skills. The key NGOs operating in SRC districts are summarized in Volume II (SN 2.1 Table 2.134).

CHAPTER 4 POTENTIAL COMMODITIES, CONSTRAINTS AND POSSIBLE COUNTERMEASURES FOR AGRICULTURAL COMMERCIALIZATION IN THE STUDY AREA

4.1 Potential Commodities and Value Chain Studies

4.1.1 Preliminary Selection of Potential Commodities

In order to select the potential commodities for the detailed value chain assessment, an exercise to narrow down the number of probable HVCs was conducted. The products were identified and prioritized following the consultative processes. Brainstorming workshops with the district stakeholders, i.e., officials from DADO, DLSO, and DFO were carried out to identify and prioritize commodities. Decisions for prioritization and scoring are made through consensus.

The following sequential steps were taken for the prioritization of high value agricultural commodities in each study district.

- **Step I:** List all high value agricultural commodities (fruits, vegetables, cash crop, and spices) which are grown in the district together with their area and production.
- **Step II:** Preliminary screening of commodities which are grown commercially or have commercial value, mainly those commodities which are traded locally or exported outside the district.
- **Step III:** Short listing of commodities based on two criteria (a) profitability per unit area and (b) possibility for expansion. The Five-point Likert Scale was used to measure each indicator, where 5 as the highest and 1 as the lowest. Discussions were made prior to giving score against each criterion and scores were assigned through consensus. Scores against each indicator is added and total score is calculated. A score of three is given to each high value agriculture commodity for both vegetables and fruits, and livestock products getting the highest score were selected for further prioritization.
- **Step IV:** Prioritization of selected commodities considering (a) market prospects (b) peoples' involvement in production (c) value addition and processing (d) business services (e) organizations, and (f) environment. Scoring of each indicator was made based on Five-point Likert Scale, with 5 as the highest and 1 as the lowest. Scores against each indicator was aggregated and six prioritized agricultural commodities receiving highest aggregate scores were identified for each district. During the discussions, participants were requested to identify six commodities, representing agriculture, livestock, and NTFP. Also during discussions, a consensus was made that among the six selected commodities at least two should be from livestock, one from NTFPs, and three from high value agricultural commodities.
- **Step V:** Tentatively select the top three high scorers as subjects for further study.

4.1.2 Value Chain Study of Selected Commodities

(1) Selection of the Commodities Subject for Value Chain Study

Taking the results of the preliminary selections of potential HVCs into consideration, 11 commodities were chosen for the value chain study. Table 4.1 shows the list of these 11 HVCs.

Table 4.1: 11 HVCs Subject for Value Chain Study

#	Commodity Type	Commodity	Kavre	Dolakha	Ramechhap	Sindhuli
1	Vegetable	Potato	✓	✓	✓	✓
2	Vegetable	Tomato	✓	✓	✓	✓
3	Vegetable	Cauliflower	✓	✓	✓	
4	Vegetable	Cabbage	✓	✓	✓	
5	Fruits	Junar			✓	✓
6	Fruits	Orange	✓	✓		✓
7	Fruits	Pineapple				✓
8	Fruits	Lapsi	✓	✓		
9	Spice	Turmeric				✓
10	Livestock	Milk (buff, cow)	✓	✓	✓	✓
11	Livestock	Goat (meat)	✓	✓	✓	✓

The above listing was made based on the scores obtained through prioritization process but added with considerations of some particular candidate commodities in question, e.g., yak milk is produced only for processing at a limited quantity, ginger and cardamom have been studied by other various parties, turmeric can be a substitute for ginger due to the high price fluctuation recently experienced, amrisho will be treated as fodder for livestock, pomegranate is emerging but too early for value chain study, etc. It should be noted that these potential commodities not included in the list of value chain study will still be given attention in the course of the Study as deem appropriate.

(2) Purpose, Conceptual Framework, and Methodology of Value Chain Study

1) Purpose

The main purpose of the value chain study is to thoroughly understand the value chains of selected HVCs from inputs to consumption as well as associated factors such as various support services and policy environment with a view to identify constraints and points of interventions in the chains so as to inform the preparation of DBDS.

The value chain studies of 11 HVCs were conducted focusing on:

- Mapping of value chain actors and stakeholders operating at the different level,
- Analyses of cost and margin of different value chain stakeholders,
- Explore potentialities and constraints of selected commodities, and
- Conduct the SWOT analysis and recommend potential strategies and interventions.

2) Conceptual Framework

A value chain is defined as a full range of activities required to take a product or service from conception to final disposal after use, through the intermediary phases of production, processing, and delivery to final consumers. The value chain approach (VCA) focuses on the interaction of actors along each step of the production system as well as the linkages between each actor. VCA considers trade relations as being part of a series of networks of producers, processors, wholesalers, and retailers, etc., whereby knowledge and relationships are developed to gain access to markets for producers and suppliers for markets.

Value chain analysis is a process that requires four interconnected steps, namely: data collection and research, value chain mapping, analysis of opportunities and constraints, verification of findings with stakeholders, and consider recommendations for future actions. These four steps are not necessarily sequential and can be carried out simultaneously. Figure 4.1 illustrates the study process and components. The value chain study team collected data and information through secondary and primary sources by way of research and interviews. The collected data was analyzed using the value chain framework to reveal constraints within the chain that prevent or limit the exploitation of end market opportunities. The resulting analysis of opportunities and constraints was verified with stakeholders through events such as workshops and focus group discussions.

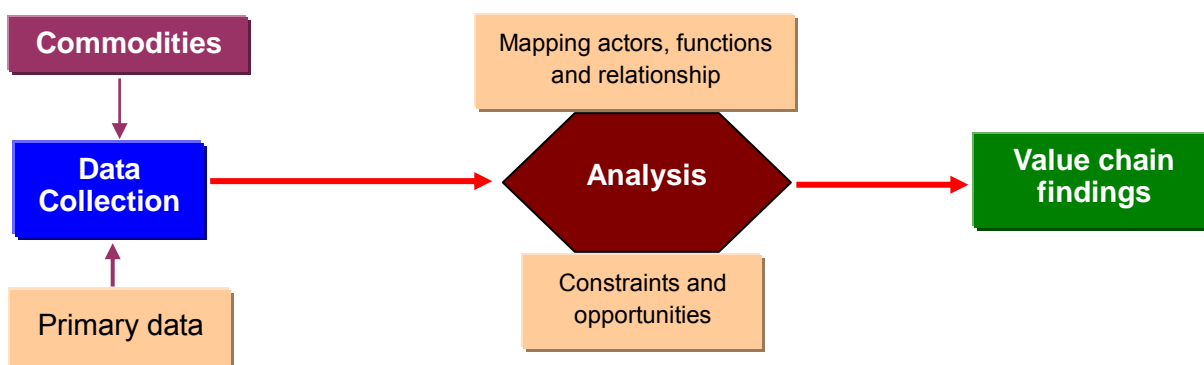


Figure 4.1: Process of Value Chain Study

3) Study Methods

Literature review: Available study reports, annual progress reports, and statistical information on Nepalese agriculture were reviewed to collect information related to cultivars, area, production, yield, market price, sales quantity, production location, price, producer groups, etc.

Interaction with producers: Interaction with producers was carried out in key production zone of each district while focusing on:

- Production processes (cropping calendar);
- Access to services/mapping of service providers (technical/technological, finance);
- Input suppliers and mechanism;
- Market chain mapping (place and actors);

- Transportation system and practices;
- Grading and packing practices;
- Cost of cultivations;
- Price and pricing mechanism; and
- Problems and constraints.

Interaction with producers also focused on (a) core processes in the value chain, i.e., from input provision to retailers and (b) identifying and mapping of main actors involved in the above processes.

4.1.3 Value Chain Study Results

Through the value chain studies, it became clear that constraints exist in each step of the value chain, ranging from inputs for production to marketing and distribution, with some similarity and variability among different HVCs.

The level of commercialization in the areas where physically close to major consumption market and relatively accessible through road networks which are found as more advanced. For example, majority of HVCs have been transported by trucks in Kavre while majority is carried to the market by farmers on foot in Ramechhap. In Dolakha, agriculture has also been partially commercialized by some producers taking advantages of accessibility through the Araniko Highway and agro-climatic features of the area.

It was confirmed that the functions performed by the existing market distribution system play a key role for commercialized commodities. Therefore, it should be regarded as indispensable for commercialization. The existing market distribution system as a whole is functioning through the interplay among value chain actors with each one of them shouldering its own shares of costs and risks. However, there are still various constraints that exist within the system. It is considered that producers also can and should increasingly play important roles by strengthening the reciprocal interplays with the players in the existing market distribution system.

The results of value chain studies in general reaffirmed that the improvement of accessibility through the Sindhuli Road and associated road networks will provide the study areas with opportunities to become good HVCs production sites. However, the results of value chain studies also suggested that it is essential to make multi-dimensional efforts in order for the areas to become reliable production sites, including ensured quality and stable supply, joint works among producers in various dimensions, and establishment of functional relations with market actors especially with and through intermediate players.

The Value Chain Study Reports are attached in SN 4 in Volume II.

4.2 Main Constraints to Agricultural Commercialization in the SRC Area

4.2.1 Constraints to Agricultural Commercialization in Study Area

The constraints for the agricultural commercialization in the study area are various in types and

multi-tiered in their relations. However, the major constraints are considered to be in and around the “weak linkage in distribution system” among others. Figure 4.2 depicts the major constraints in agricultural commercialization based on the understandings of the Study Team.

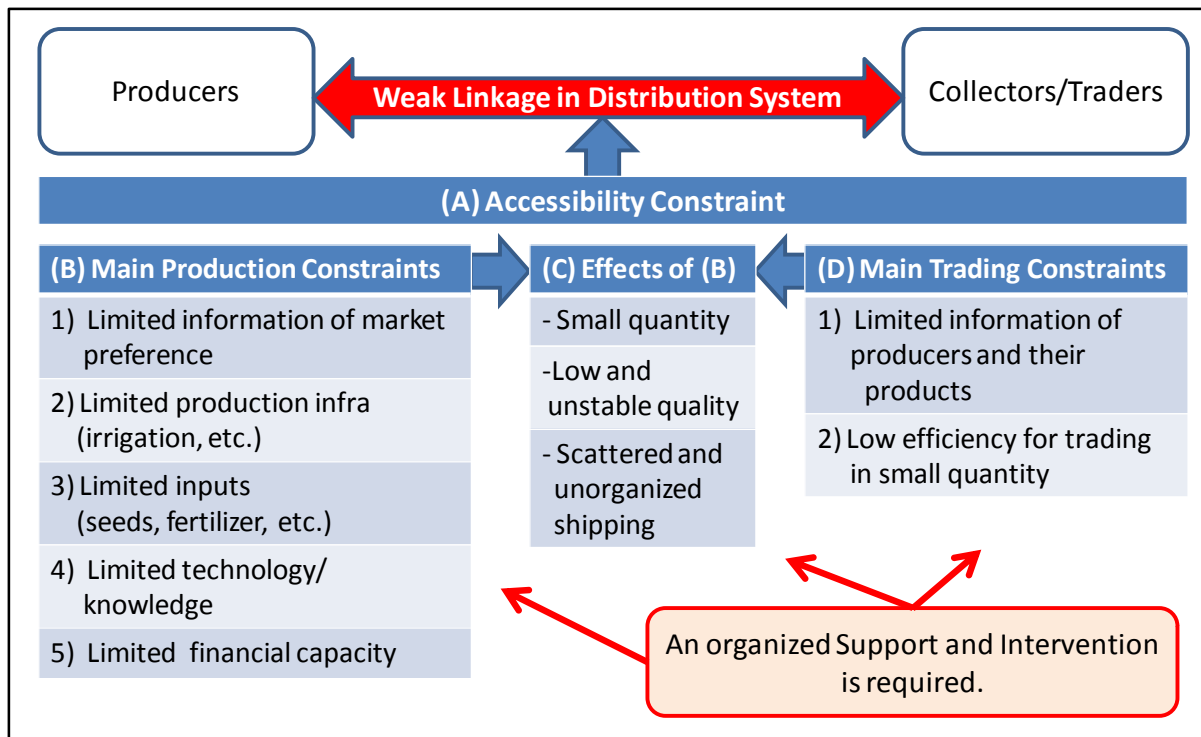


Figure 4.2: Major Constraints to Agricultural Commercialization in the Study Area

The figure above does not include the constraints identified in the course of the Study, rather, it highlights the most important constraint, i.e., weak linkage in the distribution system. In the above figure, “(A) Accessibility Constraint” encompasses almost all other constraints as an umbrella constraint and directly contributes to the weak linkage in the distribution system. However, as discussed in Chapter 6, this accessibility constraint would be gradually alleviated through strategic and local road network improvements in the coming years. Provided that accessibility constraint will be alleviated, what remains as most prominent constraint is “(C) Effects of (B)” in the above figure. In the eyes of collectors/traders (that are the reflection of consumers’ preference and demands), HVC products in small quantity and low and unstable quality and under scattered and unorganized shipping are not attractive for their business. Therefore, organized supports and interventions to address both production and trading constraints will be required in parallel to change the situation by maximizing the opportunity resulting from the accessibility improvement so as to strengthen the linkage in the distribution system. In following sections, the main constraints identified will be presented.

4.2.2 Main Constraints (Vegetables and Fruits)

The main constraints considered as inhibiting the promotion of commercial agriculture in the study area are listed in Table 4.2. Although there are series of constraints in all stages from preparation to distribution in the supply chain of vegetable production, majority of the constraints are correlated with the lack of appropriate distribution system. The farmers in the study area have very limited opportunity to sell their products. They cannot sell, therefore, they do not produce.

The constraints for fruits are basically the same with vegetables. Besides, fruits like Junar and oranges require long-term planning not only for production aspect but also for financial aspect, which make the producers' decision making process rather difficult. Also, fruit orchards in the study area are mostly located in the remote area and in steep slopes. The works in both cultivation and harvesting are very hard, and the young generations are not willing to take over the orchard. Orchard farmers are experiencing severe successor problem.

Table 4.2: Main Constraints for Agricultural Commercialization in Study Area (Vegetables and Fruits)

Position in the Supply Chain	Type of Activities	Items	Constraints
Preparation	Financial Input	Initial fund	• Lack of fund for procurement of initial inputs
	Natural Resource/ Infrastructure	Land	• Limited availability and poor condition
		Water	
		Soil	
	Production Input	Seed	• Limited number of suppliers • Less variety in each supply • Poor quality • High price
		Fertilizer	
Chemical			
Material			
Machinery			
Production	Cultivation	Equipment	• Low availability of service • Low accumulated knowledge • Limited capacity of extension officers
		Technology	
		Extension	
	Postharvest	Warehouse	• Few and poor facilities • Limited availability of equipment • No practical systems applied
		Storage	
		Grading	
		Packaging	
Distribution	Transportation/ Shipping	Collection Center	• Few and poor facilities
		Vehicle	• Limited number and types of means
		Quantity	• No efficient volumes
	Marketing	Information	• No appropriate information system established
		Management	• Low accumulated knowledge
		Trader	• Limited number of players

Source: JICA Study Team

(1) Lack of Input Suppliers in Number and Performance

Input suppliers, like agro-vets, play very important roles for production. Their roles are expected not just to provide the ordered goods to farmers but to introduce new useful and beneficial inputs, as well as, practical and applied extension knowledge to producers and even to JT/JTAs. Through these activities, input suppliers should be in the feedback loop of the market information to producers, by collecting and analyzing the market information, e.g., consumers' demand for target commodities. Lack of these capable input suppliers in number as well as in performance is inhibiting agricultural commercialization in the study area.

(2) Limited Capability of Production

The conditions in the study area are not very favorable for commercial production of vegetables in both physical condition and knowledge aspect. For the physical condition, small size farm lands located on slopes, erosion, and limited water resources are commonly observed. As for the knowledge aspect, limited technical knowledge of producers constraints the quality of vegetable production since most producers in the study area have no experience in vegetable production for commercial purpose, therefore they have no accumulated knowledge. In addition, while the agricultural extension system is expected to perform a major role, the existing government extension service is very limited in terms of outreach and frequency, due mainly to budgetary constraints, as described previously in Section 3.5.2 (3).

(3) Less Efficient Marketing System and Lack of Understanding of its Functions

The lack of efficient marketing mechanism is considered a more serious constraint than those of the production side. Generally, the condition of vegetable marketing system in Nepal is still at the primary level: Monetary transactions and physical transactions are handled together by the market chain actors such as traders. Although such system is considered less efficient³⁶, the traders are playing significant roles in the existing marketing system. However, their roles in the communication chain seemingly are not properly appreciated. Moreover, financial risks traders who are shouldering their inventory management are not properly appreciated by other actors. The existing and potential roles and functions that the traders can perform, together with their current limitations in vegetable marketing system, should be properly understood by other stakeholders to be able to discuss the optimal utilizations as well as further improvements in the value chain.

(4) Lack of Appropriate Intermediary Actors for Commercialization

Producers generally have very limited channel for marketing. In order to secure sales and appropriate prices for their produce, producers must maintain constant contacts with traders and/or collectors. Most commercial farming producers in the study area have constant contact with only 1-2 traders/collectors, and therefore, they have very limited choice where to sell their produce. Also, since most of the traders in the existing system operated independently and in small scale, the risk of being out of business is considered high. Depending on the few numbers of small traders to handle all commodities is considered very risky. If traders are small in size, more numbers of traders should be involved in order to hedge the risk of default.

Furthermore, the amount of information communicated through traders will be limited when number of traders is limited. In order to understand the latest market conditions (not only the current market price, but also the trends of consumer preference, based on which producers should decide their

³⁶ In an advanced marketing system, the communication chain for monetary transactions and logistics chain for physical transactions exist separately. The actors who provide information receive fees for their information services, while the actors who provide logistics receive fees for physical services. Although people generally tend to think information service is not worth for a fee, collection and analysis of the information require as much time and labor as that of physical service.

production plan), securing various reliable information channels is important. Lack of such information increases the risk in marketability.

(5) No Appropriate System to Handle Vegetables

Inventory control is one of the most important factors in the supply chain management. Vegetables are perishable commodities, and they must be handled properly and promptly. However, there are neither enough facilities nor appropriate management systems to maintain the good condition of vegetable. Maintaining the appropriate condition of vegetables not fully depends on physical facility but also on human activity. Lack of understanding on how to handle and manage the commodity may lead to increased bad inventory and less profitable vegetable marketing business.

(6) No Uniform Standard of Commodities' Grading

Stability in quality and quantity is an important factor for marketing. With the appropriate grading system, market players can trade their commodities efficiently without detailed inspection. However, farmers in Nepal hardly practice the grading, and market players must inspect each commodity at all times in order to secure quality. This inspection entails extra cost for each market player. Lack of uniform grading standard severely limits the development of efficient market distribution system.

(7) Low Quality (Fruits)

Fruit is consumed as rather luxury than necessity. Therefore, the quality factor such as taste becomes more important. However, under the current situation, availability of necessary inputs for improving the quality of fruits is limited; and therefore, quality stays low as against market demand. In order to improve fruits marketability, fruit products shipped from the study area must achieve basic quality improvements.

4.2.3 Main Constraints (Livestock: Dairy)

(1) Milk Production

Over the years, milk gradually became a commercial commodity and important source of cash for farmers in the outskirts of Kathmandu. In addition to DDC, several private dairy companies were set up in Kathmandu Valley, and the milk collection network has been expanding to meet the rising demand. Despite the development of milk distribution networks, the production capacity stayed relatively low. It became clear that milk production capacity would be improved by strengthening the communication and exchange of new information with other areas, genetic improvement of livestock, improvement of feeding management, disease prevention, and so on. In the past few years, the government has been promoting AI projects in the study area. However, judging from the agricultural statistics, these aspects seem to remain underdeveloped.

1) Poor Animal Feed Management

It was found that the green fodder given to the milk producing cattle and buffaloes in the study area is insufficiently. This is particularly so during the high lactating period from December to February. This period of insufficient feed has a negative effect on the total milk yield. Alternatively, there are enough

crop residues available in the area, but crop residues are so low in nutrient value that they cannot provide livestock to even the maintenance energy. New roughage resources will need to be developed.

2) Genetic Improvement

In the reproduction of buffaloes and cattle, only a limited number of farmers are using AI services. Its lower conception rates and higher costs³⁷, compared to natural service, can be given as reasons for farmers not adopting AI as much. Also, the availability of frozen semen is low due to the difficulty of the government to obtain liquid nitrogen for the storage and transport of the frozen semen. It is estimated that available frozen semen covers only about 9% of needs in the country.

In comparison, in natural breeding, female cattle and buffaloes in heat are brought to the stud bulls in the village. However, the bloodline and genetic capability of these stud bulls is unknown; and therefore, no improvement of milk production capability is attained. In addition, it is likely that inbreeding occurs where the number of stud bulls in a district is limited. In an attempt to solve this issue, the government brings in stud bulls from other districts and distributes them to farmer groups for mating purposes. They are not, however, monitoring the implementation of this scheme, nor keeping records of the daughters' milk yields.

3) Improper Health Care

Around 60% of buffaloes and 56% of cattle were treated for liver fluke³⁸ (Fascioliasis) in Nepal. If lactating buffaloes and cattle have the parasite, milk yields and milk quality are reduced. Livestock is infected if they eat rice straw or other plants with Cercaria (a larval form of liver fluke lives in paddy fields). As during the dry season, rice straw is the main form of feeds, there is a very high risk of liver fluke parasitism infection among livestock in the rice growing districts.

In terms of buffalo, mastitis is a serious disease as it reduces milk yield and quality. The main cause of infection is the poor hygienic environment during milking and poor feeding. Most livestock are tethered to peg on the muddy ground where the bacteria grow very easily during the day, the floor of the cattle sheds is not hygienic either and the milkers do not wash their hands before milking. This situation should be improved.

4) Lack of Technical Knowledge and Assistance

Technical information from the outside has been unevenly distributed, and is not disseminated in the area. Eventually, there are large differences in technical skills and practice among farmers, including how to utilize limited feed resources. This is not solely a problem of extension officers. Farmers' technical level and experience also play a big part. For example, it is important for all farmers to recognize that they must ensure self-sufficiency in feeds. Nevertheless, these skills of how to use local resources such as trees to feed livestock have not been thoroughly disseminated to some farmers.

³⁷ In rural villages, the AI service fee is Rs.500 at the first time, and in the case of no pregnancy, also Rs.500 at the second time.

³⁸ Liver fluke is a large trematode which is parasitic in the biliary duct, this is common to both humans and livestock.

(2) Milk Distribution

One of the most serious constraints for milk distribution is the poor road condition. The study area is a mountainous area having scattered milk production area. People need to lug milk from the mountain to milk collection centers along the main roads. In this situation, even if milk production increases, transportation of milk would be the bottleneck in the area. Another constraint is power outage. For the milk to be transported to Kathmandu, it needs to be chilled first at the milk chilling center to maintain the quality of milk. This is an important function in the milk supply chain. During the peak milk supply period in January and February, there are planned power outages and this has serious effects on the milk chilling center's operations.

4.2.4 Main Constraints (Livestock: Meat)

(1) Meat Production

1) Goat

As for production cost, natural grazing is considerably cheaper compared to stall feeding. It also allows goats to be able to select the field they graze on. The production yield is also higher. However, in the forested areas, the goats are susceptible to ectoparasites such as ticks. Especially, Khari/Jamnapari crossbred (less than 50% of Jamnapari gene ratio), which has been promoted by the government and has higher demand in the market because of their large body and better carcass yield, cannot graze in the steep slope and forested areas. In order to meet the market demand, they should be stall fed, thus making it necessary to acquire secure feed resources. Currently, there are insufficient green fodder and crop residues available. Therefore, for those small farmers with limited land holdings, it is important to develop feeds production on non-arable land and forest land.

2) Buffalo

In the situation that a large number of old dry buffalo cows are brought in from India at a reasonable price, the domestic meat production in Nepal needs to fatten male buffalo calves at a low cost. In order to achieve this low-cost production, farmers need to establish a feeding system, rearing the animals on self-supplied forage feeds. However, in the study, due to limited feeds supplies, the farmers cannot spare their important roughage resources to feed male buffaloes, other than those used for working purposes.

(2) Meat Distribution

Most of the livestock for meat is raised on the farms in Terai Region or India and brought to Kathmandu by Indian traders. Around 80% of the goats had been imported from India to Kalanki Market in Kathmandu³⁹ because of stable supply, low production and transportation cost, and low waste rate. On the other hand, goats raised in Nepal are bought directly from the farmers by local traders, and then transported to Kathmandu by public transportation, etc. In this situation the transportation costs is relatively high. Eventually, the price of livestock from India is lower than that

³⁹ Source: Data obtained by the Study Team in December 2012 as well as a retrospective study of goat marketing in Kathmandu Valley: A Case Study of Kalanki Khasi Bazar, Shyam S. Yadav, 20 July 2011

of domestic produce.

In Nepal, as it is customary to eat fresh meat that has been slaughtered on that day, the livestock intended for meat consumption are all traded alive. In general, these livestock are slaughtered, butchered, and sold at the retail level by butchers. Both the quality of meat and the hygienic standards of facilities where slaughtering and butchering take place are reflected in the pricing, hence it all depends on the customer's choice. The Study Team cannot find any major problems with the current fresh meat distribution system.

4.2.5 Main Constraints (Producer Organizations)

The keys to realize agricultural commercialization are stable supply, large production volume, and good quality. The following are the major constraints regarding producers' organizations for agricultural commercialization.

(1) Shortage of Successor

The latest census indicates that over two million Nepalese are working outside the country. Working abroad is a typical phenomenon among young male generation in their early 20s. Urbanization trend also decreases male population in the rural area where agriculture is the main sector. Shortage of agriculture labor or successor to the land makes farmers hesitant to invest in inputs or facilities, even though more investment is required to increase their production volumes. At the village level, the main labor force in agriculture is women and seniors who remain in the area and tend to be satisfied with present subsistence farming. They are not willing to expand their production activities for agricultural commercialization, rather stick with traditional and subsistence farming.

(2) Lack of Understanding of Cooperative System

Despite the government's effort since the 1950s, the concept of cooperative does not penetrate into farmers' minds. Some farmers even showed uncooperative attitude to collective/voluntary works, because they think these works do not directly link to their profits. In addition, lack of knowledge and skills for cooperative operation is an issue. While MOAD constantly provides technical trainings to cooperative members, it seems that outcomes are not yet likely reflected in practice.

(3) Cooperatives as Aid /Financial Institution-oriented Body

This constraint mostly applies to cooperatives. One of the benefits to form a cooperative is obtaining an opportunity to receive large-scale financial support and matching funds from the government or donors. The problem is that cooperatives limit their function as a channel of financial aid distribution only and do not move forward to profit earning through joint works on production, marketing, and distribution.

Besides the above constraints, low awareness on the benefits of working in groups/cooperatives, limited technical knowledge and inputs, lack of bargaining power, lack of facilities, limited production method to overcome seasonality, and free riding on projects/programs are recognized as other constraints in this area.

4.3 Possible Countermeasures for Constrains

4.3.1 Possible Countermeasures (Vegetables)

Countermeasures for the constraints identified for commercialization of vegetables, especially on production aspect include conventional approach of **construction and rehabilitation of irrigation facilities** so as to promote the crop diversification as well as intensification. Such irrigation systems include community-managed small-scale irrigation as well as diesel and electric pump irrigation systems that utilize perennial water flows. These countermeasures as a matter of course should be considered in particular locations where such options are suitable. However, majority of production locations in the study area are not endowed with suitable conditions for these options. On the presupposition that these conventional options will be adopted wherever suitable, other countermeasures are considered.

As identified in the value chain studies, market players such as traders and wholesalers create substantial part of the values producers receive. In order to create more values in the chain, more market players need to be attracted into the market chain to improve efficiency through competitions. They also contribute to bring precise information from consumption area, which is critical for producers to efficiently produce based on the appropriate crop planning. There must be sufficient numbers of actors in order to neutralize the biases, and each player must be able to provide a good amount of quality information. Good communication among market chain actors also helps in minimizing waste and inventory risks to improve the margin value in the value chain.

In order to attract good market players and create a good communication network, the environment of market system must be improved. Not just a small number of people in this industry misunderstand that intermediary actors in a marketing system are the exploiters rather than contributors. Such misunderstanding must be corrected. The government sector should take a lead role in guiding producers to cooperate with the market players.

Concrete countermeasures for the constraints explained in the previous section are explained in the following section.

(1) Improve the Physical Linkage between Production Area and Consumption Area

Improvement of logistics is an important factor to attain cost efficiency, and therefore, establishing a collection network in which the scattered produce in the area is aggregated into a central collection center would be effective. As shown in Figure 4.3 producers bring their produce to a collection point at a walking distance from where a vehicle comes around to pick up the loads. One vehicle goes all over several collection points. There should be several vehicles that will go around in the different areas. In the end, these vehicles will gather the loads into a central collection center within the district, which is on the major highway, e.g., Sindhuli Road. The transport of aggregated produce to the central markets in Kathmandu and other destinations is relatively economical.

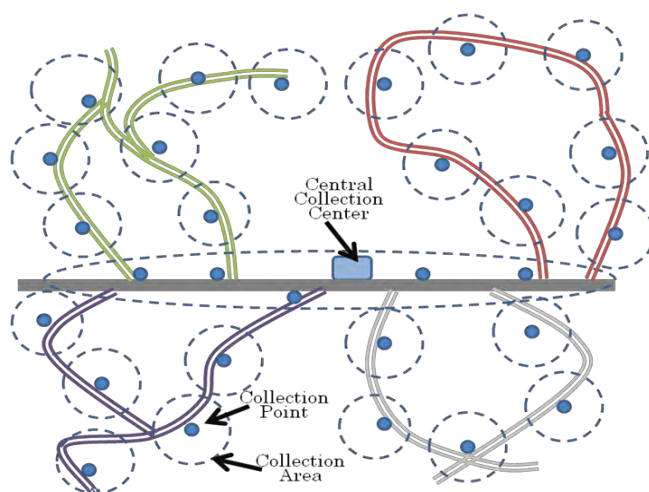


Figure 4.3: Hierarchical Network to Aggregate the Scattered Produce in the Hill Area

Communication is important in this system. Coordination with producers and transporters is a very important task. Producers must understand that once this system has started they will bring their commodity to the designated collection points not by choice but as their duty.

One of the critical tasks of this central collection center is to manage the logistics of vehicle operation, which includes determining the necessary number of vehicles, frequency of collection, and volume of producers' produce at the collection points in order to minimize operational costs. Another important task is to know the market information; when, where, and how much of demand are going to exist and therefore, the time they need to collect and ship the products should be ascertained. The management must plan production according to this forecast and should make an order for production to each farmer based on the shipment schedule. The management of the central collection center requires extensive coordination work between central markets and producers as well as with all the market chain players. It also requires the processing of a heavy load of information for market-oriented activity, and the cost of doing such work must be evaluated properly. This is the activity that agricultural cooperatives can potentially perform in the future.

(2) Improvement of Vegetable Quality

In order to guarantee the supply of stable and reliable produce, appropriate countermeasures in the production process should be introduced in the study area. Table 4.3 suggests several countermeasures to improve the production side of potential vegetables.

Table 4.3: Potential Countermeasures for each Potential Vegetable Crop

Crops	Countermeasures
Potato	There are limited extra spaces in the fresh market for new supply. However, demand for processed potato is not yet filled. Most of the potatoes used for processing are imported from India and their shipment period is from February to April. Potato shipment from the study area starts from April and could extend until July or August by storage. If the study area can produce appropriate variety of potato for processing, new demand could be developed.

Crops	Countermeasures
Cauliflower	Transportation is a major constraint. How to keep the produce fresh is the key factor to promotion. There is no appropriate packaging done for the produce. Each cauli head is wrapped in its own leaves. This method protects the vegetable to a certain extent, but it weighs about one third of the total load, which affects the total cost. Improvement of packaging may boost the condition of cauliflower production.
Cabbage	Availability of transportation limits the production area of cabbage. In order to improve transport efficiency, grading system should be introduced. Separate the cabbage with same size for packaging may reduce the load size. It also may have different marketability.
Tomato	There still is a very constant demand throughout the year. Promotion of plastic house for off-season (rainy season) tomato would have high potential. Farmers can produce them in dry winter season with small irrigation equipment. There might be a chance to generate long seasonal cash income with reasonable amount of investment.

(3) Improvement of Input Delivery System, Quality and Timing

Availability of input supply is the basic factor for quality production. It is a common practice in other countries that farmers receive credit for input supply and make payments after their harvest, but this is not the case in Nepal. Agro-vets should play major roles, but both their number and quality are not adequate to satisfy the demand of producers. They also have no delivery and credit system for farmers. Instead, traders provide credit to producers for inputs on the commodity they are going to buy later. However, producers sometimes sell their products to other markets and not even pay back for the inputs. Producers complained that the price was too low compared to the market price at the time. This makes the credit transaction with producers infeasible.

An ideal arrangement to solve this problem is that producers cooperative should be involved in the operation of the central collection center suggested in the previous section, and together with the collection center management to guarantee the credit to producers for input supply. Agro-vets should be invited into the management unit of the collection center, and they should support to provide appropriate information and supply to member producers. Payment for the products will be guaranteed by the products that producer shipped through the collection center. This management of input procurement should help in the delivery of quality and timely input supply to member producers.

4.3.2 Possible Countermeasures (Fruits)

Developing an orchard takes a few years to have its first harvest, and have to maintain the same trees for several decades. Orchard management requires long-term planning as well as strong commitment of producers. Constant market is required for stable management of orchard. If the government decides to promote its production, development of the market should be planned in accordance with the plantation.

(1) Quality Improvement of Fruits

Cultivation practices as well as use of input supplies are not appropriate to attain the best quality in fruit production in the study area. Table 4.4 suggests several countermeasures to improve the production quality of potential fruits from field preparation to postharvest.

Table 4.4: Potential Countermeasures for each Potential Fruit Crop

Crops	Countermeasures
Junar	The quality of fruit is inconsistent and sometimes the taste disappoints the consumers. Junar has no significant difference in market appearance to Indian oranges. One reason for this could be that cultivation standard is not established and orchard care is inappropriate. Among countermeasures for many inappropriate practices in the production, improvement of sapling is the most important and most provable countermeasure as quality of sapling determines the quality of produce. Generating a system to supply high quality sapling is important.
Orange	Current practices adversely affect crop production. Pruning and thinning are hardly practiced, and intercropping especially with maize severely affects trees in the absorption of fertilizer and sunlight as well as harms the roots when the field is plowed. Introduce proper orchard management and compare cost-benefit of the total practice. Introduce alfalfa as feeds crop for utility cropping instead of vegetables in the orchard.
Pineapple	Several methods can be recommended for the improvement of pineapple production such as cultivation, fertilization, and selection of variety. But the expected demand for the expected improvement seems not feasible. Considering cost-and-effect relationship, the recommendation is to maintain the current condition.

(2) Develop a Processing Demand for Increased Production

Along with quality improvement activity, development of processing measures and demand creation for the processed product are needed. There are several beverage companies in Nepal. They already developed a certain level of production skills and marketing channels. It is worth exploring the possibility to work with those existing corporations for production and marketing of the fruits from the study area. As for Junar, FNCCI, Junar Central Cooperative Union, and public sector players are jointly establishing a processing plant to produce Junar juice. If this plan is successfully implemented, certain volumes of excess Junar production are expected to be utilized for juice production.

4.3.3 Possible Countermeasures (Livestock: Dairy)

(1) Milk Production

1) Animal Feeding Management

The major constraints in milk production mainly exist in the production stage rather than in the distribution stage. In particular, seasonality of feeds availability is one of the most serious constraints.

Regardless of the seasons, enough nutrition that dairy animals require to produce good quality and quantity of milk should be secured. In order to address this constraint, three countermeasures are suggested in the following section.

Development of Roughage Based on the Feeding Techniques

In Nepal, during dry season when natural feeds become scarce, lactating buffaloes and cows are fed with the porridge-like mixed concentrated feeds⁴⁰ to supplement their nutrition. However, the amount and nutrient of mixed feeds have not necessarily met the nutrient requirements for potential milk production, and as a result, the effect of the mixed feeds is somehow limited. In order to obtain full potential effect from the mixed feeds, better managed feeding system is necessary. In addition, by formulating a mixture of feeds, for example chopping the roughage into smaller pieces, other benefits such as digestibility and feeds intake may be improved. The well-controlled nutritious complete feeds will improve the quality and quantity of milk production.

Establishment of Increased Feeds Production Technique

In order to secure enough feeds in the community, planting plants for forage in the near-by selected locations such as road side, road side slope, or steep slope that are unsuitable for agriculture could be considered. For the selection of plants, combination of herbaceous plants and woody plants would be the best option, considering the soil conservation and disaster prevention aspects (integration of the forage and fodder tree production with road side bio-engineering techniques used in the Nepal road sector). It is also necessary to establish a seed distribution system for these trees in the community. Re-distributing the seeds within the community, the forage cultivation area would be expanded yearly.

Effective use of Low-quality Roughage

Roughage (rice straw and maize stover), broadly available and used in the study area, can be treated by urea to improve dry matter intake, nutritive value, and storage stability. This simple technique is broadly in practice all over the world as well as in other parts of Nepal. Therefore, this technique should be tried out to see the impact on milk production of cows and buffaloes.

2) Genetic Improvement

Promotion of Genetic Improvement of Cows and Buffaloes

The genetic ability of government distributed buffalo stud bulls and cattle stud bulls⁴¹ are unknown as there is a lack of proper monitoring and recording system. As a result, selected stud bull for higher dairy performance is not clearly observed. It is an urgent task to install an identification and evaluation system for genetically superior bulls in Nepal. By keeping a record of milk production of daughter buffalo cows and cows, with the cooperation of farmers, superior bulls and cows or buffalo cows will be identified and certified as “superior bulls” or “superior cows” both for buffalo and cattle. Their semen could be used for AI technique in order to produce “superior bulls” and “superior cows”

⁴⁰ Crop residues such as straw and maize stover are mixed with maize powder, rice bran, wheat or mustard oil case bran, and heated with water. That makes porridge-like mixture.

⁴¹ They were distributed to farmers as part of the district dairy livestock generic improvement plan.

both for buffalo and cattle of next generation.

3) Health Control

Control of Liver Fluke (*Fasciola hepatica*) Infection

Liver fluke (Fascioliasis), the most widely spread disease of buffaloes and cows in Nepal, should be prevented by treating rice straws before feeding the livestock or applying dung into the paddy field. Infectability of liver fluke larva could be gone by treating rice straws by urea or by heating. This is materialized by preparing mixed feeds as mentioned above. Also, understanding that eggs of the parasites can be killed by heating the prepared mixed feeds needs to be taught together. Holding technical seminars for dairy producers on how to improve milk production could be a very effective countermeasure.

Prevention of Mastitis

Mastitis is a major illness directly affects the quality and quantity of milk production. The feeding, milking, and resting place of dairy animals should be kept clean and dry in order to prevent mastitis. It is suggested that making the feeding and milking stall floor concrete will have some effect in preventing mastitis⁴². A team composed of the district veterinary officer, animal health technical assistant, and village animal health worker implement check-up and assess dairy animals for mastitis. They also conduct educational activities to the farmers in order for them to understand how important it is to prevent mastitis.

(2) Milk Distribution

The most serious constraint in milk distribution is the poor local road condition. The rural road network needs to be built. It would enhance market access for farmers, even in the rainy season. The priority of the development budget that came from the VDC of the Ministry of Local Development has already been placed in road maintenance, reflecting the residents priority of development through an access road to the highway.

4.3.4 Possible Countermeasures (Livestock: Meat)

(1) Meat Production

Improvement of Weight Gain

For meat production, the same constraints of milk production prevail. The shortage of feeds, in terms of quality and quantity, is a serious problem and will eventually cause low weight gain of meat animals. To address this issue, again, the establishment of a self-sufficient forage system is crucial. A feeding management program for high breeding rate as well as high weight gain should be created: the program suggests the combinations of feed resources that are available in each season. Seasonal shortfall will be supplemented by growing extra fodder trees and pasture.

⁴² Mortar floor also enables farmers to collect urine to utilize it as fertilizer. It also has repellent effect on insects.

(2) Population Increase (Goats)

Traditionally, in the hill areas, cross breeding between the Khari-breed and the Jamunapari-breed has been promoted in order to effectively increase the number of goats that are equip with high environmental adoptability, breeding ability, meat productivity, and lactating ability. However, there is a big difference among individuals due to lack of well-planned cross-breeding practice. To address this outstanding problem, the appearance evaluation technique and selection skills need to be developed and introduced in this area. The breeding practice will allow farmers to produce goats with great physical features and meat quality so that they can compete with Indian exported goats that are currently preferred by butchers over the domestic goats in the future.

Improvement of Rearing Environment

Improvement of rearing environment for goats calls for an urgent attention as stress from uncomfortable rearing place leads to low breeding rate and low weight gain. The proper scale, low-cost goats sheds needs to be developed, by using locally available materials. This idea can be disseminated by constructing a model goat rearing facility for demonstration, and raise awareness among goat rearing farmers.

(3) Meat Distribution

It is expected that some of the goats and buffaloes that are currently sold for meat in the Terai Market will be transferred to Kathmandu through the SCR in the future. After the completion of construction of the SCR, holding areas for these livestock will be needed. However, development of the distribution system of livestock should be led by the private sector; and therefore, the government needs to take some measures to promote the private sector's effort, including preparing new policies or regulations that enhance the flow of livestock.

4.3.5 Possible Countermeasures (Producer Organizations)

(1) Members' Good Understanding of Cooperative System and Strong Motivation for Joint Work

It is essential for each member to clearly understand the advantages and disadvantages of forming a group/cooperative when associating with it. In terms of cooperatives, the Cooperative Act makes it obligatory to conduct a certain volume of administrative works and voluntary works. First, members shall be provided with some explanations and information on a cooperative system through seminars and training. It is important for members to appreciate the joint works with regard to cooperative operation.

The next step shall be raising members' motivation for group work, or joint work, providing some incentives, including study tours to a model group/cooperative or providing matching fund and conditional financial support. Active joint works can increase efficiency on both production and marketing, when it is properly designed.

(2) Involvement in the Value Chain and Competitive Bargaining Power

One of the advantages of participating in the value chain as producers' organization is that bargaining power would be strengthened than being individual farmers. Tips for involvement in the value chain are that the group per se has negotiation capability with a good leader, therefore securing stable supply. Once group's operation functions well, they can also practice grading, sorting, and packaging to keep a certain level of product quality. Adding to it, a group leader shall have a broad network to key actors in the value chain as well as public sector including government officials with a good sense of business. He/she can also be capable of producing an integrated strategic operational plan and stimulating farmers'/members' motivation. The type of leader may garner the trust of the members and make his/her group/cooperative more unified. These are the conditions for the producers' groups to be involved in a value chain and obtain competitive bargaining power.

(3) Sufficient Government Supports

Sufficient agriculture/livestock inputs from GON are one of the important elements for farmers to engage in farming effectively. Not only material support but also technical and managerial supports are appreciated. Particularly, trainings and advanced technology⁴³ dissemination to the young generation is highly recommended to prevent the outflow of young people to urban areas. The provision of sufficient support to the young generation may mitigate shortage of successors in agriculture/livestock sector. Simultaneously, groups/cooperatives shall be proactive in communicating with JT/JTA and private sector to keep smooth and sufficient service provision.

⁴³ Advanced technology is used not only in the production but also in marketing, networking, management, and so on.

CHAPTER 5 DRAFT BASIC DEVELOPMENT STRATEGY AND PILOT ACTIVITIES

5.1 DBDS for Agricultural Commercialization in Study Area

Based on the discussion made above, the DBDS as the basis of the M/P was prepared.

5.2 Core Strategies

The Study Team proposed the outline of DBDS aiming at agricultural commercialization in the study area towards 2020, with the core strategies listed as follows:

- Strategy 1:** Promote the SRC area as the production center of HVCs especially that of vegetables, fruits, and milk, in order to supply the rapidly growing food demands in Kathmandu metropolitan area.
- Strategy 2:** Promote the production of off-season vegetables and fruits by taking advantage of the agro-ecological features of the SRC area in order to supply the demands in Kathmandu metropolitan as well as in Terai plain area.
- Strategy 3:** Strengthen both the “production” and “distribution” aspects of HVCs in a parallel manner, in order to carry forward the agricultural commercialization. The production aspect comprises production increase, quality improvement, and stable supply. The distribution aspect comprises efficient arrangement of distribution facilities and establishment of business linkages between producers’ organizations and private sector businesses.
- Strategy 4:** Focus on the creation of pro-private sector environment in the SRC area in order to support the efficient involvement of private sector players. This is because in the strengthening of both “production” and “distribution” aspects, integrated efforts, e.g., technology, facility, organizational and institutional aspect, will be required and the involvement of private sector players is considered indispensable.
- Strategy 5:** Work progressively in the areas where accesses and prime condition for agricultural commercialization, will be improved through road network improvements, taking the right crops for right lands into consideration.

In following sections, the BDS for relevant subsectors will be described based on the core strategies presented above.

5.2.1 Development Strategy for Vegetables

The BDS for Vegetables consists of following components.

- (1) Promote the growth of the SRC area as a major supply station of HVCs to Kathmandu Valley.**
- (2) Focus on the improvement of the marketing system.**
- (3) Strengthen the function of producers' organizations to deal with market players.**
- (4) Establish a strategic information flow between consumption and production areas.**
- (5) Produce quality products that are marketable and profitable for market players.**

(1) Promote the Growth of the SRC Area as a Major Supply Station of HVCs to Kathmandu Valley

Self-sufficiency rate of vegetables is relatively high in many countries as vegetable is a very perishable commodity. The location of the production tends to be physically close to consumer markets, and Nepal is not an exception. Vegetable supply to the urban area tends to rely on the suburban agriculture. Ensuring the stable supply base of vegetables for major cities is one of the important government duties.

In case of Nepal, development of major supply bases of vegetables for metropolitan Kathmandu in order to support its rapidly growing population is an important task of the national government. The vegetable supply for Kathmandu area is now largely supported by suburban agriculture in Bhaktapur and Lalitpur. However, those two major supply areas are shifting to urban area to absorb the growing population of Kathmandu Valley and as a result, the farm lands in these areas are diminishing.

The population statistics⁴⁴ indicated that the population of the metropolitan Kathmandu is growing very fast. Kathmandu is growing with an annual rate of 4.76% in contrast to rural area where population is decreasing. People are moving into urban area, especially the male population. As young male population moving out from rural villages, agricultural labor must be adjusted towards less heavier physical work. Promoting the shift towards vegetable production which requires relatively lighter labor inputs than that of cereals may be an appropriate strategy for the study area.

After the completion of the Sindhuli Road, access to the major consumption area of Kathmandu from the study area will be significantly improved. In addition, part of the current major production area i.e., Lalitpur and Bhaktapur are slowly diminishing due to urbanization. For these reasons, **the study area has an advantage as well as a necessity to become vegetable supply station for Kathmandu Valley in the near future. GON is expected to promote the study area to grow as a vegetable production area to ensure the stable and reliable supplies of vegetables to Kathmandu Valley.**

(2) Focus on the Improvement of the Marketing System

1) Government Role in Efficiency Improvement of the Marketing System

The approach of development strategy for vegetables is not only for production but also for the efficiency improvement of the market system. Since vegetable is perishable, over-supply directly and

⁴⁴ Nepal Census 2011

promptly results in lowering the market price and vice versa. As the price sensitivity for supply is very high with vegetables, the supply fluctuation makes both producers or consumers suffer from the price fluctuation. However, in Nepal, a prompt communication system to stabilize the vegetable supply is not yet developed. For example, in Japan, if the supply of produce decreased, import will be increased immediately to fill the deficit. On the other hand, if the supply increased over a certain level, producers start to abandon the products to adjust the volume of production. In promoting the commercial production of the vegetables in the study area, **the government should consider the introduction of appropriate measures to maintain the stable price of vegetables by balancing the demand and supply of commodities.**

2) Each Player Plays its Role in the Market Chain: Producers Focus on Farming/Producing

The value chain map identifies players and values created by these players in a market chain. It became clear that 95% of the products (in case of tomato) traded in the study area are passing through other players (non- producers) and only 5% of the production are directly sold by producers to consumers. While the disaggregated values created by each player are not precisely identified, the total created value through this market chain is the result that every single player has carried out their own duties. With this farmers are receiving positive value from this mechanism.

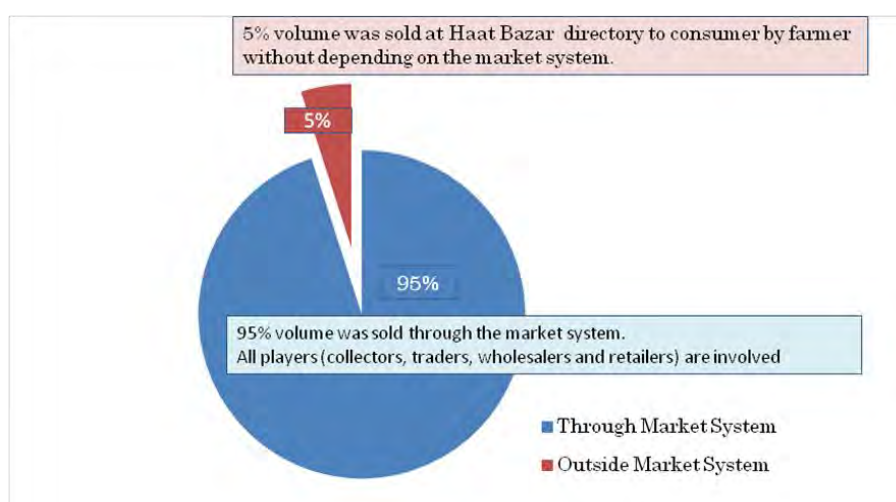


Figure 5.1: Volume Ratio of Shipment at Farm Gate (Tomato in Kavre)

Majority of shipments went into intermediary market chain, where the transactions are handled by traders and wholesalers. Producers have very limited ability to handle their commodities by themselves. Producers must rely on traders and collectors for marketing. It is obvious from the above figure that vegetable marketing cannot exist without these market players. Producers are professional growers but not traders. Trading is fundamentally a different work from production. In order for producers to concentrate on farming/producing, marketing aspect should be taken care of by other players, including the government for its regulatory function and traders for marketing. **The basic strategy for agricultural commercialization must be focused on improvement of marketing system by efficiently outsourcing this task to intermediaries and secure markets for producers.**

3) Provision of Market-related Facilities in Strategic Locations

In order to help in improving the marketing system, some physical measures should also be

considered. For example, in order to improve the physical linkage between production and consumption area, provision of hierarchical networks of collection points and central collection centers in numbers of strategic locations in the study area are considered important. Moreover, the provision of regional level collection centers in strategic locations is worth considering. For example, constructing a multi-functional collection center in Kurkhot, where Sindhuli Road and north-south feeder road from Ramechhap across the Sunkoshi River connects in the near future, creates good potential to set up large size collection center for all HVCs, equipped with cold storage facility, technical information services such as ASC and agro-vets shops, etc. Given its strategic location, it can function as an important regional service hub for both logistics and information flows to multiple directions.

(3) Strengthen the Function of Producers’ Organizations to Deal with Market Players

One of the major purposes of agricultural cooperative is to aggregate uniform commodities to improve efficiency in shipping and marketing. In order to meet consumers demand for timely and stable quality produce, traders aggregate each individual farmer’s commodities in the current marketing system. In the future, cooperatives could be formed to take over this traders’ duty; however, unless they handle this task more efficiently than traders, producer would stay depending upon traders. After being equipped with the relevant capacity, cooperatives may be able to develop different stream of transactions independent from current market chain.

Diversity in the market stream is also important to hedge the risk. If cooperatives can maintain multiple streams of transactions, risk of price fluctuation becomes lower and security for producers is improved. However, it is improbable to expect producers to become capable to perform this kind of management task by 2020, the strategy aims to improve intermediary market players to take this duty.

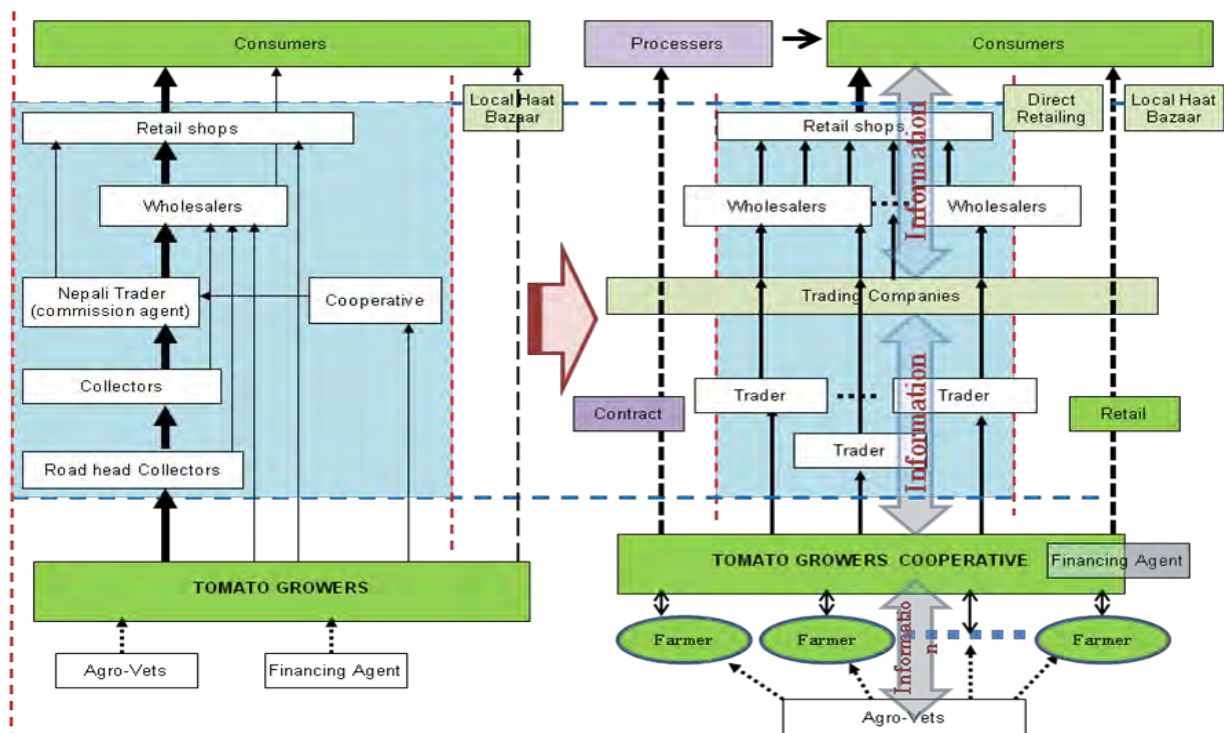


Figure 5.2: Value Chain Structure; Present and Future

In the meantime, the government should at least guide farmers to initiate the effort in establishing a cooperative to perform as “one-stop-window” for all traders. The government also should assist individual traders to become more effective and efficient. Local traders also need to form a group to have more negotiating power with central traders/wholesalers and also with cooperatives. While the cooperatives stay out of business transactions, traders must carry out the duty of negotiating better price with downstream players. Assisting in the development of this capacity would directly benefit the producers. Also, traders must carry out the duty of transferring information concerning the consumer preferences and any useful information for producers to increase their benefits.

(4) Establish Strategic Information Flow between Consumption and Production Areas

Not all market players are necessarily involved in the physical transaction of commodity. If traders transfer the information between each trader without actual transportation of commodity, degradation of the commodity will decrease and also unnecessary transportation cost will be omitted.

Communication between consumption and production areas is also important to balance the demand and supply. Traders collect information to relocate the commodity so the shortage and surplus should be balanced. This task becomes more efficient if the information is gathered in one place. Promote to establish a mechanism to congregate the demand and supply information need to be included in the government strategy. Consumption and production information is also important to analyze the future trend of demand. Traders in the central unit of market need to share this information and analysis to suggest producers about production planning for the next season. Efficient utilization of this information improves in the reduction of both daily and seasonal misallocation of commodities and contributes to stable supply and price.

The information channel that the government should help establish does not concern daily price movements. Establishment of a more broad and strategic information system which can contribute to the streamlining of the entire system and demand and supply balance for both consumers and producers benefits are required.

(5) Produce Quality Products that are Marketable and Profitable for Market Players

In order to improve the market chain structure, by attracting more intermediary actors who will add values for producers, producers need to improve the quality of their products. The strategies the government should undertake in order to improve the quality of products and services in attracting more market players in the value chain are discussed below.

1) Introduction of Uniform Standard for Grading

Mutual trust between market players and producers are not yet developed. Currently, producers and traders must agree at each transaction after the inspection of the commodities. This inspection process causes a lot of unnecessary cost and labor. The government should promote and introduce a uniform grading standard to avoid unnecessary inspection works. Mutual understanding must be initially developed. It must start from educating farmers of its benefit: Reduction of wastes when shipped as lowered shipment cost or less cost for inspection leads to higher price for production.

Producers will also have better understanding of consumer demands, and farmers must apply certain farming methods to increase marketable commodity.

2) Stable and Reliable Quantity for Efficient Delivery

In order to be an attractive production area, it must have stable quality and quantity of products to be a reliable source for the traders. Traders will repeatedly comeback to this reliable production area. As a single producer cannot attain this stability, a group must be formed to produce same commodity with the same standard of method. Producers must understand that stable and efficient production is possible only with constant inventory supported by uniform group production.

To help ensure stable and reliable quantity of product supply, some physical measures such as various forms of irrigation systems with technical advice should also be implemented.

3) Appropriate System to Acquire Input Supply

High quality product cannot be produced without appropriate inputs. In order to maintain a stable quality, stable input should be applied. Agricultural inputs are mainly supplied by agro-vets in Nepal, though their number is limited and also the qualities of their services are not very high. The government should promote to strengthen the capacity of agro-vets so as to improve the farmers' access to quality inputs.

Considering the current constraints of government extension system through JT/JTA with no prospective improvements in the near future, working through agro-vets for agricultural commercialization should be considered as a possible alternative. Agro-vets could provide technical services and practical knowledge to farmers through their regular businesses. Efficient extension work could be expected by empowering those Agro-vets.

5.2.2 Development Strategy for Fruits

Fruits basically take the same strategy as the vegetables. Improvement of the market system is the same task that should be taken by the government. The BDS for Fruits consists of following components.

Same strategies listed for vegetables will be adopted, though in addition especially for fruits;

- (1) Develop marketing system of fruits**
- (2) Take into account the outflow trend of young males**
- (3) Focus on truly marketable fruit commodities**

(1) Develop Marketing System of Fruits

The improvement of the marketing system for fruits should be sought for in the same direction with vegetables as described above. Currently, marketing of fruits especially Junar still mainly depend upon local traders. Many cooperatives under the Junar Central Cooperative Union have a system to guarantee the sale of harvest: The cooperative buys Junar from producers and shoulder the risk to sell. Yet, many producers sell Junar to local traders by contracting the whole tree of produce even before

the produce gets ripe. By doing so, producers can shift labor intensive, hardest harvesting work in the orchard to traders, even though it brings lower unit price. The harvesting workers hired by traders often damage the trees which adversely affect next year's production. This outsourcing practice needs to be addressed, probably through the union in the future.

(2) Take into account the Outflow Trend of Young Males

Orchards are generally located far into the mountains. The location and condition of the orchard is relatively severe and young people are reluctant to stay there to inherit the farm. This trend would not easily be halted; thus, lack of young male laborers must be taken into account in the planning of further development of orchards. The labor intensive approach will not be feasible in the near future and the strategy should focus on quality improvement in the limited area, rather than simply expanding the orchards to increase production. In order to improve the quality of fruits, same strategies discussed for vegetables are also applicable. Grading and input supply improvement should be included in the strategy for fruit development.

(3) Focus on Truly Marketable Fruit Commodities

Pineapple was included in the list of potential crops for development in the previous report; however, the demand and supply is quite balanced at present. If it is promoted, local market will soon saturate and price may go down to induce abandonment. Government should look at the market carefully with regard to the capacity of demand. On the other hand, promotion of the emerging and potential commodities, including pear, persimmon, grapes, kiwi, pomegranate, etc. should be continued considering their future marketability coupled with certain marketing strategies.

5.2.3 Development Strategy for Livestock (Milk, Meat)

The BDS for Livestock (dairy and meats) consists of following components.

- (1) Give priority to milk and goat meat for livestock development.**
- (2) Give priority to ruminant animals over non-ruminant animals considering the feed resources of Nepal.**
- (3) Put the highest priority on improvement of livestock productivity based on traditional ways of livestock rearing.**
- (4) Take measures so as not to disturb the activities of the private sector in light of milk distribution.**

Given the availability of feeds resource in Nepal, ruminant animals have been given priority over non-ruminant animals. The result of calculations by Pande (1997) to determine the domestic feeds balance for all livestock in Nepal is shown in Table 5.1 below. Although area and volume of cereal cultivation and production have somehow increased in the last 13 years, feeds resource balance is not improved due to the increase of human and livestock population⁴⁵. Most of the feeds for non-ruminant

⁴⁵ Between 1996/7 and 2009/10, the population of cattle had grown by 2%, buffaloes 44%, sheep -0.8%, goats 49%, pigs 47% and fowl 65%, according to the Statistical Information on Nepalese Agriculture, MOAC, 2009/10

animals, such as swine and poultry, need to be imported into Nepal, and commercialized poultry and swine farming have been contributing to increase the imports of agricultural products in recent years. In case of large-scale swine farming, a high level of technical skills related to feeding and reproduction management is necessary. Although demand of pork is somewhat limited for traditional reasons, there is a chance that demand for pork will increase in Kathmandu in the future.

Table 5.1: Feed Balance in terms of Dry Matter (DM)

Item	Total DM (million ton)	Feed Category (million ton)		
		Crop Residues	Green Fodder	Grain & By-products
Feed demand	26.9	9.1	15.1	2.7
Feed available	18.6	10.7	6.9	0.9
Balance	-8.3	1.6	-8.2	-1.8
Percentage	-30.8	17.6	-54	-66.7

Source: As referred by R S Pande 1997 from Chet Raj Upareti, 2007

Even today, farmers engaged in livestock rearing follow the traditional ways. While there is commercial trading of dairy and meat products, animal rearing is not commercialized yet because the animals are owned as assets, in other words, milk is produced for self-consumption; therefore, any excess on the family needs enters the commercial supply chain.

For farmers, goats, sheep, pigs (local), and chickens (local) are all assets, and they are major sources of income. Livestock is sold for cash as necessary; and thus, livestock plays an important role in supporting livelihood. The best strategy for commercialization in the study area is to improve the productivity of livestock products, retaining traditional ways of livestock rearing. In other words, improvement of livestock productivity may realize commercialization. Buffaloes, cattle, and goats, which are reared by almost all Nepali farmers, are the reasonable targets for commercialization considering bottom-up development. From the above discussion, the basic strategy for livestock sector until 2020 is focused on improvement of dairy and meat (goat meat) productivities.

1) Increase Milk Yield per Buffalo and Cattle.

The most important issues to address, in order to improve milk production, are improvements in feed management techniques, genetic capacity of livestock, and countermeasures to prevent or mitigate livestock diseases. If these issues are tackled in an integrated way, milk production capacity is expected to be improved. Since improvement and prevention are mutually related, it is desirable to promote them in a parallel course.

2) Develop Reproduction and Fattening Techniques

As 90% of the goats in the livestock markets in Kathmandu are imported from India, if increase of domestic goat production gains its share in the market, it needs to produce good or better goats than that of the imports. In order to achieve this goal in the study area, **reproduction and fattening techniques need to be developed** for breeds having environment adaptability and marketability. In particular, projects for improvement of weight gain, increase herd numbers, and improvement of rearing environment will be implemented as pilots in the study area.

5.2.4 Development Strategy for Producer Organizations

The BDS for producer's organizations consists of following components.

- (1) Transform agricultural cooperatives/groups from welfare service organizations into profit-seeking organizations.**
- (2) Guarantee stable supply to meet demand in the value chain.**
- (3) Conduct joint marketing work and build a trusting relationship with traders.**

(1) Transform Agricultural Cooperatives/Groups from Welfare Service Organizations into Profit-seeking Organizations

Producers' groups shall be one of the players in agriculture/livestock business value chain. Having a business in mind, seeking a profit as a group creates sustainability of their production activities. Otherwise, agriculture in Nepal depends on subsistence farming, keeping away from agricultural commercialization. Once a successful group appears, it is explained that other groups are stimulated and transformed into business-oriented organization in a chain reaction.

(2) Guarantee Stable Supply to Meet Demand in the Value Chain

From a production aspect, producers' groups shall secure a stable supply and a certain level of quality, enhancing productivity and introducing a quality monitoring system, namely, standardization. To increase productivity and quality levels, investments in agro-inputs, facilities, and technology are highly required. Being a profit-seeking group enables the producers' groups to invest in the above items to upgrade their production.

(3) Conduct a Joint Work on Marketing and Build a Relationship of Trust with Traders

As mentioned as one of the Horticulture Strategies, it is critical for producers' groups to jointly involve in marketing activity, establishing networks with private sector and with reliable traders. Building a trusting relationship between producers' groups and traders makes producers to concentrate on production and reduce unnecessary costs or labor, such as carrying their products to the market by themselves. Then, producers' groups enjoy commercial farming.

5.3 Pilot Activities: Activities, Outcomes, and Lessons

5.3.1 Objectives of the Pilot Projects

The pilot projects were implemented in the study area from July 2012 to October 2013. The objectives of the pilot projects were:

- To verify the validity of DBDS;
- To reflect the lessons obtained from the implementation of pilot projects to the revision of DBDS;
- To establish the referential model in the promotion of HVCs; and

- To develop the capacity of MOAD staff through their involvement in the planning, implementation, and management of pilot projects.

The pilot projects were prepared and implemented taking into consideration multiple aspects of agricultural commercialization, e.g., facilities, technologies, marketing, and organization development. The pilot activities also tried to encompass the entire value chain to address bottlenecks in the promotion of HVA commodities so that the outcome of the pilot activities would help in the verification of DBDS.

5.3.2 Composition of Pilot Projects

The pilot activities consist of three categories, i.e., core, horticulture, and livestock, as listed in Table 5.2. These activities were designed to address the main constraints identified in DBDS. The two core pilot projects were implemented, combined with vegetable package, fruit package, milk package and/or goat package, depending on the commercialization model that each pilot site has to seek for.

Table 5.2: Pilot Activities

#	CORE Pilot Projects		
C-1	Improvement of Agricultural Commercialization Support Service from DADO/DLSO		
C-2	Introduction of Integrated Collection Center System under Public-Private Partnership (PPP) Approach		
#	HORTICULTURE Pilot Activities	Vegetable package	Fruit package
H-1	Introduction of Unified Standard Group Production for Marketing	✓	✓
H-2	Introduction of the Multiple Water Utilization and Micro Irrigation System	✓	
H-3	Utilization of Rain-shed Plastic House	✓	
H-4	Quality Improvement of Seedlings and Saplings	✓	✓
H-5	Single Cropping and Tree Management for Citrus (especially Suntara)		✓
H-6	Appropriate Pruning and Thinning for Citrus		✓
H-7	Introduction of Unified Grading and Proper Packaging System	✓	✓
H-8	Junar Processing for Improvement of Storability and Transportability		✓
#	LIVESTOCK Pilot Activities	Milk package	Goat package
L-2	Development of Roughage and Concentrate Mixed Feeding	✓	
L-3	Fodder Yield Improvement by the Establishment of Technique by Utilizing Slope Area	✓	✓
L-4	Evaluation of Dairy Performance of Distributed Stud Bulls by Government	✓	
L-5	Monitoring of Candidate Breeding Buffalo Bull and Breeding Bull by Using Frozen Semen (Artificial Insemination: AI) for the Efficient Implementation of Genetic Improvement	✓	
L-6	Liver Fluke/Internal Parasite Control	✓	
L-7	Improvement of Housing of Milking Animal for Hygiene Control and Prevention of Mastitis	✓	
L-8	Improvement of Rearing Environment for Goats		✓
L-9	Improvement of the Local Practice of Goat Selection		✓
L-10	Establishment of Roughage-based Stall Feeding Technique		✓

Table 5.3 shows the pilot activities' positions in the value chains. The CORE pilots of C-1 and C-2 are related with all other pilot efforts.

Table 5.3: Proposed Pilot Projects in Value Chains

Categories		Horticulture Crops		Livestock		DADO/ DLSO Support Groups
		Vegetables Package *	Fruits (Citrus) Package	Dairy (Milk) Package	Meat (goat) Package	
→ Value Chain →	Production	H-1 H-2 H-3 H-4	H-1 H-4 H-5 H-6	L-1 L-2 L-3 L-4 L-5 L-6 L-7	L-3 L-8 L-9 L-10	← C-1 ←
	Post-Harvest Handling	H-7	H-7 H-8			
	Marketing/ Distribution	C-2	C-2	C-2	C-2	

* For the convenience in operation and for the ease of comprehensions by concerned parties, these combinations of different activities were later grouped as “packages.” Please note that each one of above-listed package should be added with C-1 activity.

The underlying notions for C-1 and C-2 are as follows:

C-1: DADO and DLSO personnel were expected to be involved in the implementation and monitoring of all these pilot activities as supporter for agricultural commercialization. They were supposed to guide and help producer groups wherever they could, but at the same time, to learn from experiences gained through his/her involvement in the pilot activities for the promotion of agricultural commercialization.

C-2: Marketing of HVCs can be more effective when efficiency is achieved from production to shipping. PPP approach, in which concerned-stakeholders form a group and discuss how the efficiency of particular value chain can be improved, was put in the center of the pilot activity. The collection center was built as part of the pilot activity which plays the important roles.

Brief descriptions of the pilot projects are shown in the following section.

CORE Pilot Projects	
C-1	Improvement of Agricultural Commercialization Support Service from DADO/DLSO
Target Crop	All crops and livestock
Location	ASC coverage area of DADO/DLSO where pilot projects will be implemented.
Target Group	Producers groups (cooperatives etc.) undertaking the pilot projects.
Implementation	<ul style="list-style-type: none"> • Guide and support target groups for implementation of pilot projects wherever JT/JTA can. • Accumulate the experience in promotion of agricultural commercialization through pilot implementation.
Monitoring	<ul style="list-style-type: none"> • Writing of daily log. • Performance and outcomes of pilot activities involved.

	<ul style="list-style-type: none"> • Interview with producer groups for their performance.
Demonstration Effect	<ul style="list-style-type: none"> • Improved capacity of JT/JTAs in promoting agricultural commercialization. • Outcomes of all pilot projects will bring out demonstration effects.
C-2	Introduction of Integrated Collection Center System under PPP Approach
Target Crop	Vegetables, fruits, milk, livestock for meat
Location	<ul style="list-style-type: none"> • Central location of various producer and their groups within an accessible distance. • Appropriate and available lands, size, and location on the roadside.
Target Group	<ul style="list-style-type: none"> • Member of active producers group. • Farmers practice various types of agriculture in both horticulture and livestock. • Willing to sell their produce through management of collection center. • Traders and input supplier in the value chains.
Implementation	<ul style="list-style-type: none"> • Facility development. • Coordination of participants with PPP modality based on Participatory Market Chain Approach proven in some other areas of Nepal. • Coordinate market management committee to link marketing and production. • Link this activity with other pilot projects.
Monitoring	Quantity of handled produce, efficiency of collection, sales amount, etc.
Demonstration Effect	<ul style="list-style-type: none"> • Increase in handling volume and sale of collection center. • Improvement in marketability.

HORTICULTURE Pilot Projects	
H-1	Introduction of Unified Standard Group Production for Marketing
Target Crop	Vegetables, Fruits
Location	Combination with C-2
Target Group	Producer groups producing the same crop
Implementation	<ul style="list-style-type: none"> • Coordinate producers to produce the same crop with the same standard. • Arrange input in the same standard. • Organize workshop to understand equal standard of cultivation management. • Plan and start production in same procedure to attain the same quality crop as group.
Monitoring	<ul style="list-style-type: none"> • Process and outcome of each producer's practice. • Quality and condition of produce as output. • Marketability and profitability.
Demonstration Effect	<ul style="list-style-type: none"> • Improvement in market response for stable and reliable quality and quantity. • Improvement in marketability leads to better price. • Efficient handing with uniform product.

	<ul style="list-style-type: none"> • Lower inventory management cost and reduction of wastes. • Increase of profits.
H-2	Introduction of the Multiple Water Utilization System (MWUS) and Micro Irrigation System to Improve Productivity of Dry-season Vegetable in Less Irrigated Area
Target Crop	Tomato, cauliflower, and other green leafy vegetables
Location	<ul style="list-style-type: none"> • Accessible distance from major road for proper delivery of fresh vegetables. • Accessible distance to carry the water into the system from water source. • Appropriate water source available at the upstream.
Target Group	Members of producer groups with abilities to shoulder partial cost of the system and to maintain it as well also can afford to buy other inputs.
Implementation	<ul style="list-style-type: none"> • Coordinate with the community for water use. • Design the basic structure of water utilization system. • Establish a local supplier to view the distribution and maintenance.
Monitoring	<ul style="list-style-type: none"> • Distribution condition of water through the system. • Quantity and quality of produce, labor condition, and sales.
Demonstration Effect	<ul style="list-style-type: none"> • Improvement of life and work conditions after introduction. • Quantity of vegetable produced during dry season. • Increased profit from vegetable production.
H-3	Utilization of Rain-shed Plastic House for Improvement of Quality and Quantity for Vegetable Production
Target Crop	Tomato, cucumber, and green leafy vegetables
Location	Accessible distance from target site of C-2
Target Group	Producers have funds to shoulder part of the initial and maintenance cost, with the capability to build the frame by himself.
Implementation	Combination with H-2 (drip irrigation)
Monitoring	Harvest, quantity, condition, labor, and sales
Demonstration Effect	<ul style="list-style-type: none"> • Quantity of production, sales amount, and profit. • Analyze the cost (setup for facility and maintenance, production input, labor, etc.) and benefits (sales, improvement of labor quality, etc.).
H-4	Quality Improvement of Seedlings and Saplings for Commercial Production
Target Crop	Tomato, Junar, and orange
Location	Accessible area from target crop growers
Target Group	<ul style="list-style-type: none"> • Seedling and sapling producers. • Existence of at least one established business as a seedling producer in the region.
Implementation	<ul style="list-style-type: none"> • Provide technical assistance to transfer appropriate ideas and techniques. • Guarantee of the sales value for experimented seedlings.

	<ul style="list-style-type: none"> • Partial assistance of equipment, if needed.
Monitoring	Condition of seedling, number produced.
Demonstration Effect	<ul style="list-style-type: none"> • Survival rate of seedlings and saplings. • Fruit quality, plant and tree conditions. • Profitability of seedling production.
H-5	Single Cropping and Tree Management for Citrus Orchards
Target Crop	Orange
Location	Commercial orchard in accessible distance from major road for monitoring.
Target Group	<ul style="list-style-type: none"> • Managing orchard with vegetable intercropping under tree. • Implementing a traditional practice of tree management.
Implementation	<ul style="list-style-type: none"> • Shift the under tree cropping pattern of orchard from vegetable to perennial feed crop. • Appropriate variety needs to be identified from experimental planting during pilot project.
Monitoring	<ul style="list-style-type: none"> • Quality and quantity of fruit, tree condition. • Labor condition, efficiency of work hours for same amount of tree care. • Total sales including vegetable sales that producers have expected.
Demonstration Effect	Compare cost, lost opportunity for vegetable production as against benefits, improvement of fruit quality and quantity, value of feeds for livestock, work efficiency, etc.
H-6	Appropriate Pruning/Thinning Techniques to Improve Citrus Fruits Quality and Quantity
Target Crop	Junar, orange
Location	Commercial orchard within accessible distance, possible for monitoring and demonstration.
Target Group	<ul style="list-style-type: none"> • Orchard growers practicing traditional tree management. • Sufficient family labor to thoroughly practice the technique.
Implementation	<ul style="list-style-type: none"> • Designate a plot to compare the techniques between introduced and traditional. • Guarantee of loss for experiment.
Monitoring	<ul style="list-style-type: none"> • Fruit quality and quantity, tree conditions. • Efficiency of work input. Compare the hours and output from work. • Total sales, compare the sales value.
Demonstration Effect	Comparison of cost (work input) and benefit (total sale, quality x quantity).
H-7	Introduction of Unified Grading and Proper Packaging System to Improve Consumer Trust
Target Crop	Cauliflower, other vegetables, and fruits

Location	<ul style="list-style-type: none"> • Area under commercial production and shipping produce in bulk without packing. • Multiple numbers of producers producing the same crop. • Within the distance of the collection center.
Target Group	<ul style="list-style-type: none"> • Producers organizing an active group or cooperative for producing the same crop. • Producers arranging transportation (truck) for shipment.
Implementation	<ul style="list-style-type: none"> • Organize the uniform production with same input and management. • Selection and packing practice at the collection center. • Examine current shipping conditions. • Identify procedure to improve packaging for efficiency of transportation. • Examine the cost and condition of transportation with new packaging.
Monitoring	Product quality, labor input, marketability, sales value, efficiency of load, condition of produce in the package.
Demonstration Effect	Improvement in marketability, loss ratio at the consumption area, efficiency in transportation, reduction in transportation cost, improvement in labor efficiency, and improvement in arrival quality at destination.
H-8	Junar Processing for Improvement of Storability and Transportability
Target Crop	Junar, orange
Location	Within the production area
Target Group	Farmer with excess production
Implementation	<ul style="list-style-type: none"> • Coordination with processing factory. • Technical assistance from processing factory for preparation and production (extraction). • Sample production of final product and marketing test.
Monitoring	Quality of primary product, quality of final product, and production efficiency (yield rate).
Demonstration Effect	<ul style="list-style-type: none"> • Reduction in product loss. • Contributions to income.

LIVESTOCK Pilot Project	
L-2	Development of Roughage and Concentrate Mixed Feeding
Target Produce	Milk (Cows and Buffaloes)
Location	Accessible distance from livestock service center, sub-service center, and DLSO.
Target Group	A group of dairy farmers, desirably relatives so that they are willing to share the results and disseminate the techniques among themselves.
Activities/ Contents	<ul style="list-style-type: none"> • Apply newly developed high nutrition feeds to dairy animals and compare the effects on quantity and quality of milk production.

	<ul style="list-style-type: none"> Rice straws chopped into small pieces (about 2 centimeters) will be mixed into the usual concentrated mixed feeds which contains corn flour, rice polish, mustard seed oil cake, or wheat, in order to increase nutrition and amount in the feeds. In addition, the concentration of TDN and CP in the mixed feeds will be fixed as more than 65% and 15%, respectively. It is expected that this inexpensive mixed feeds will improve the quality and quantity of milk production.
Monitoring	<ul style="list-style-type: none"> Quality and quantity of milk production. Extra cost and labor involved in this effort.
Demonstration Effect	<ul style="list-style-type: none"> Improvement of quality (fat contents) in milk. Improvement of quantity of milk. Increase of profit from the result.
L-3	Fodder Yield Improvement by the Establishment of Technique by Utilizing Slope Area
Target Produce	Milk, Meat
Location	<ul style="list-style-type: none"> Accessible distance from livestock service center, subservice center and DLSO. Area where community forest user group and leasehold forest user group are present.
Target Group	A group of dairy farmers, desirably relatives, community forest user group and leasehold forest user group so that they are willing to share the results and disseminate the techniques among themselves.
Implementation	<ul style="list-style-type: none"> Fodder production utilizing unused land including road side slope and agro-forestry (three tier system of fodder production). Integration of the forage and fodder tree production with road side bio-engineering. Verification of methods of planting works by using “nursery block”. Establishment of a seed re-distribution system.
Monitoring	<ul style="list-style-type: none"> Quality and quantity of milk production. Growth of the forage and fodder trees. Extra cost and labor involved.
Demonstration Effect	<ul style="list-style-type: none"> Quantity of production, sales amount, and profit. Analysis of cost (setup the facility and maintenance, input, labor, etc.) and benefit (improvement milk production and income, etc.). Environmental benefits (positive effect on soil erosion). Alleviation of hard work for women and children.
L-4	Evaluation of Dairy Performance of Distributed Stud Bulls by Government (Establishment of Dairy Performance Recording System)
Target Produce	Milk (Buffaloes and Cows)

Location	Area where distributed stud bull is present.
Target Group	Farmer groups who obtained stud bull from the government.
Implementation	<ul style="list-style-type: none"> • Certify dairy farmers who own excellent breeding buffalo cows or cows. • These certified farmers will keep lactating records of daughter buffaloes and cows. • Compare lactating records of these daughters with regular cows and buffaloes and analyze if these certified animals have higher capacity. • Evaluate dairy performance of breeding bulls.
Monitoring	Lactating records of regular buffaloes and cows.
Demonstration Effect	<ul style="list-style-type: none"> • Higher quantity and quality milk production by the daughters of these certified cows and buffaloes. • Understanding of dairy performance of stud bulls obtained from the government.
L-5	Monitoring of Candidate Breeding Buffalo Bull and Breeding Bull by Using Frozen Semen (AI) for the Efficient Implementation of Genetic Improvement
Target Produce	Milk (Buffalo, Cattle)
Location	Accessible distance from livestock service center, subservice center, and DLSO.
Target Group	Farmers who own excellent breeding buffalo cows and cows as well as high feeding technique.
Implementation	<ul style="list-style-type: none"> • Identify excellent buffalo cows and cows. • To conduct artificial insemination for these identified buffalo cows and cows • To keep the records on milk yield and reproduction of certified daughters and young bulls.
Monitoring	Lactating records of daughter buffaloes and cows.
Demonstration effect	<ul style="list-style-type: none"> • Higher quantity and quality milk production by daughters of these certified cows and buffaloes. • To be certified dairy performance of stud bulls.
L-6	Liver Fluke (Fasciola Hepatica Infection) / Internal Parasite Control
Target Produce	Milk (Buffalo and Cattle)
Location	Farmers raise several buffaloes and cattle at the paddy field area
Target Group	Farmers who owns several buffaloes and cattle
Implementation	<ul style="list-style-type: none"> • Study a case of treatment of liver fluke and actual situation of farmer's practices of animal feeding. • Treat rice straws with urea and boiling rice straw before feeding animals. • Observe effect on development of liver fluke (fasciola hepatica infection).
Monitoring	Health condition of buffaloes and cattle (or morbidity of disease).
Demonstration Effect	Decrease of liver fluke disease.

L-7	Improvement of Housing of Milking Animal for Hygiene Control and Prevention of Mastitis	
Target Produce	Milk (Cows and Buffaloes)	
Location	Accessible distance from livestock service center, subservice center, and DLSO.	
Target Group	Farmers who owns several buffaloes and cattle	
Implementation/ Activities	<ul style="list-style-type: none"> • Study a case of treatment of mastitis. • To conduct mastitis test. • Understand the situation of mastitis affected animals. • Reform the stall floor to concrete and create dry and comfortable environment for dairy animals. • Compare if there is positive effect on mastitis or other diseases. • By product urine collected can be used for vegetable production. 	
Monitoring	<ul style="list-style-type: none"> • Number of mastitis affected animals. • Quantity and quality of milk production. 	
Demonstration Effect	<ul style="list-style-type: none"> • Improvement in the quality (fat contents) of milk. • Improvement in the quantity of milk. • Decrease incidence of mastitis (or morbidity of disease). • Analysis of the cost (investment and maintenance cost, labor, etc.) and benefit (improvement of animal health, milk production and income, etc.). 	
L-8	Improvement of Rearing Environment for Goats	
Target Produce	Meat (Goats)	
Location	Accessible distance from livestock service center, subservice center, and DLSO.	
Target Group	Goat farmers	
Implementation	<ul style="list-style-type: none"> • Improve shed condition by using locally available materials. • See if breeding rate and weight gain improved. 	
Monitoring	Weight of goats, kidding intervals	
Demonstration Effect	Daily weight gain	
L-9	Improvement of the Local Practice of Goat Selection	
Target Produce	Meat (Goats)	
Location	Accessible distance from livestock service center, subservice center, and DLSO.	
Target Group	Goat farmers	
Implementation	<ul style="list-style-type: none"> • Develop the appearance evaluation technique and selection skills in order to distinguish the cross-bred goats between Khari-breed and Jamunapari-breed. • Cross-breeding technology. 	
Monitoring	<ul style="list-style-type: none"> • Skills development of farmers and government technicians. • Survival rate of kids. • Number of kid at birth. 	

	<ul style="list-style-type: none"> • Adaptability to the environment.
Demonstration Effect	<ul style="list-style-type: none"> • Increase of cross-bred goats which have higher environmental adoptability, breeding ability, meat productivity, and lactating ability. • Increase of profitability.
L-10	Establishment of Roughage-based Stall Feeding Technique
Target Produce	Meat (Goats)
Location	Accessible distance from livestock service center, subservice center, and DLSO.
Target Group	Leasehold forest user group, Community forest user group
Implementation/ Activities	Develop a new feeding management program in order to supplement seasonal shortfall of feeds by combining available fodder trees and pasture (woody plants, herbaceous plants, agricultural byproducts, crop residue, etc.) whose nutritious analysis has already been done in the past.
Monitoring	<ul style="list-style-type: none"> • Possibility of combination of fodder trees and pasture. • Weight gain of goats. • Raising number of goat heads.
Demonstration Effect	<ul style="list-style-type: none"> • Analysis of the cost (investment and maintenance cost, labor, etc.) and benefit (improvement of animal health and income, etc.). • Increasing number of raising heads from improved utilization of grass feeds.

5.3.3 Implementation Structure of Pilot Projects

The implementation structure adopted for the pilot projects is shown in Figure 5.3. JTs/JTAs from service centers of both DADO and DLSO are expected to perform as the main service delivery force. However, a total of five field facilitators (FFs), who stayed in the pilot sites in the designated district and facilitated the implementation of the pilot activities, were hired to ensure the implementation of the pilot activities.

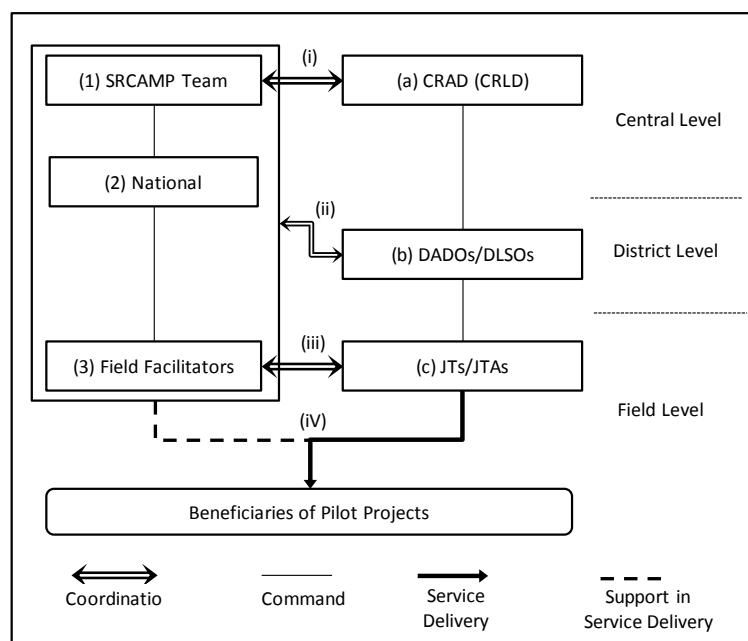


Figure 5.3: Implementation Structure of Pilot Projects

5.3.4 Selected Pilot Sites

The five pilot sites are shown in Table 5.4 and Figure 5.4.

Table 5.4: Selected Pilot Project Sites with Combination of Pilot Activities

District	Pilot Sites (VDC)	Agricultural Commercialization Models to be Sought for	Core Pilot Activities	Horticulture Pilot Activities	Livestock Pilot Activities
Kavre	Bhimkhori	Commercialization model for temperate mountainous production pockets to supply off-season crops with improved accessibility.	✓	Vegetable Package	Dairy+Goat Packages
Dolakha	Bocha		✓	Vegetable Package	Dairy+Goat Packages
Ramechhap	Hattitar	Commercialization model for subtropical river bank production pockets with improved road accessibility	✓	Vegetable Package	Goat Package
Sindhuli	Ratamata		✓	Vegetable Package	-
	Ratanchura	Quality improvement and production stabilization model for Junar	✓	Citrus Package	Dairy+Goat Packages

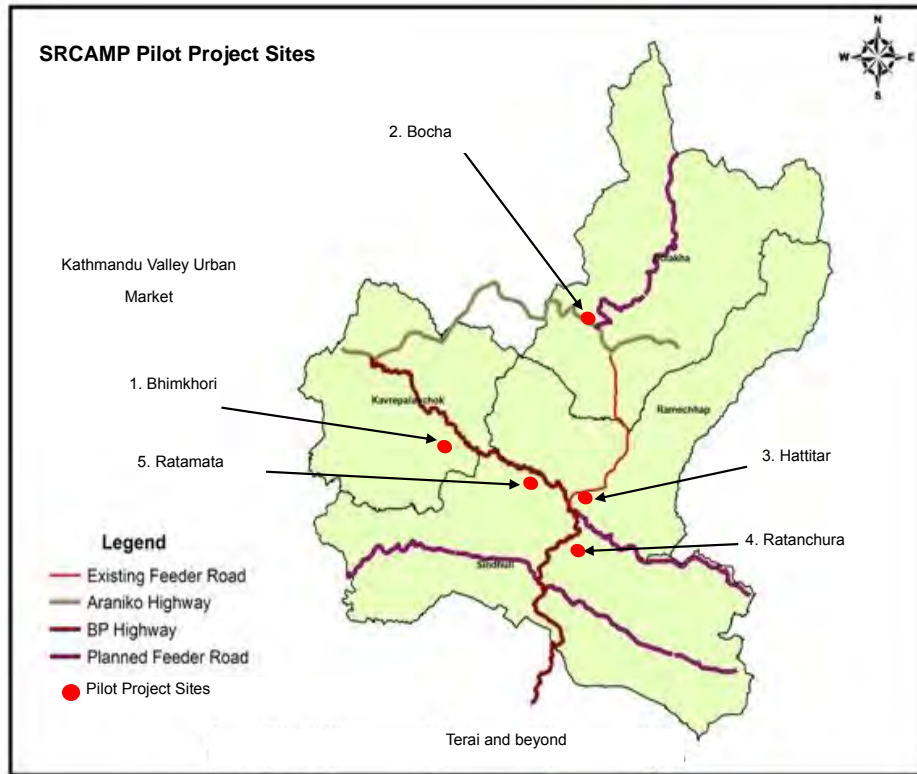


Figure 5.4: Pilot Project Sites

5.3.5 Results from the Pilot Activities

The results and lessons learned from each pilot project are summarized in Table 5.5, with further elaboration in the section following the table.⁴⁶

⁴⁶ More detailed report of the pilot activities is included in SN5 in Volume II.

Table 5.5: Pilot Project Outcomes (Summary)

Pilot Project		Relevance	Results	Lessons
Core	C-1	Long-term programs are required	The frequency of visit by JT/JTAs to the site varied from site to site, but it was very low throughout the pilot period because of their limited resources and capacity. SRCAMP Field Facilitators (FFs) complemented their roles largely. Communication between DADO and pilot farmers was kept through FFs and necessary information was provided to farmers. More attention from JT/JTAs and DADO/DLSO officers gave farmers motivation that affected them in many positive ways. In addition, improved communication led to additional supports from DADO/DLSO: follow-up assistance to the pilot sites have been provided and/or committed.	The extension capacity is very weak in Nepal where both the number and technical skills of JT/JTAs have serious limitations. Basic information on the ground in the target area is not properly accumulated either. There were so many simple problems that could be solved by a simple advice. If there are few professionals in the area, many of the existing problems can be eliminated. They may not necessarily be government officers. The role could be borne by the private sector including agro-vets, if they have acquired better knowledge and skills. It is recommended that training agro-vets to be complementary extension service professionals, in addition to the government, be considered for the promotion of agricultural commercialization.
	C-2	High direct impact observed	All four collection centers were completed in January 2013. About half of the total collection center construction cost was prepared by the farmers ⁴⁷ . Marketing activities at the collection centers started by the newly organized farmer groups in cooperation with the local traders. The farmer-trader interactive meetings were held five times, resulting in doubling the numbers of local traders as well as increasing new marketing demands from the central traders. The increased production volume made the pilot project vegetables more competitive than before. Their sales value per area had increased significantly not only because the yield increased, but also the traders were able to sell all the produce at least at the reasonable price e.g., in case of cauliflower in Ratamata, increased the sales value to 3.5 to 5.5 times. The number of commodities being handled at the collection center has also increased. In addition to the vegetables, milk collection also started. This resulted in the new service being provided to the farmers at the collection centers. For the collection center management, a study tour to the	The key for a successful collection center is management. The farmers need to understand that if they could eliminate unnecessary cost, the profit would be even higher. Increasing the collection volume, improving the quality of products, all lead to reducing the cost of transaction. In addition, the traders are one of the important value chain actors and play important roles in marketing. The real problem lurks in the inefficient system that generates extra cost. In order for both farmers and traders to gain more profits, the trust between them has to be built and efficiencies in production and marketing have to be improved. If reasonable profit is continuously generated, the activities at the collection centers will sustainably continue.

⁴⁷ For example at the Bhimkhori site, the farmers' contribution has amounted to Rs.479,000 of the total cost of Rs.966,000. The farmers at other sites made similar contributions.

Pilot Project		Relevance	Results	Lessons
			advanced centers was conducted, where farmer groups obtained tips how to manage the collection center.	
Vegetable Package	H-1 H-3	Highly adoptable by local farmers and direct impact on cash income	<p>Three kinds of vegetables for each site were selected for pilot production. Although all sites suffered from some diseases and insect damages, outcomes were satisfactory in general. Unit yield was improved significantly by SRCAMP recommended practice, compared to the traditional one: the average yield of cauliflower increased to about 2 to 6 times, tomato production increased by 1.5 to 2 times (with open cultivation in Ratamata and Hattitar). A simple change in application of fertilizer gave a significant effect. In addition, quality improvement was observed. However, the individual differences among farmers made substantial difference in both yield and quality.</p> <p>Regarding the economic efficiency, farmers' net income increased around 5-10 times for cauliflower and 20-100 times for tomato production, compared with cereal production per same unit area. Even comparing it with the traditional vegetable production method, pilot practice increased the net income by 3-7 times in cauliflower production.</p> <p>In addition to the pilot activities, voluntary activity was started. About 45 farmers in Bocha developed a new contract-type production with one central trader from Kathmandu.</p>	<p>Labor intensive vegetable production could attain a reasonable competitiveness in the SRC areas against other major production areas in Nepal. Appropriate practice with very simple and basic techniques, like appropriate application of chemical fertilizer, introduced by the pilot method improved the volume of production of up to 5 to 6 times of their traditional method.</p> <p>Given that the increase of yield brings the same effect on increasing the price per unit and eventually increased farmers' income. Also, SRC farmers' opportunity cost is low enough to compete against farmers in more advanced areas. In the meantime, the risk of converting from cereal to vegetable production is high in the area, and there are many issues to be addressed in the area to become a major vegetable production site. Therefore, follow-up support is recommended until the activity becomes a real routine for the farmers.</p> <p>Although vegetables generate more sales value than cereals for farmers, vegetable production requires more inputs, investments and labors, and has higher economical risks. In order for SRC farmers to take the risks of vegetable production, basic livelihood must be secured, which depends on traditional cereal production and livestock activities. Careful planning on how much the farmers can convert their traditional production system to vegetable production is necessary.</p>
	H-2	Cost efficiency is attained when combined with H-1,3	<p>The construction of the MWUS was completed in January 2013. About 40% of the total cost was covered by the community.</p> <p>Availability of irrigation water in dry season brought direct benefit to the farmers: they started to grow vegetables for extra cash income. A total of 53.8 ropani (about 2.7 ha) cereal field was used for vegetable production in this dry season and generated about Rs.500,000 income increment for 17 households. In addition, access to drinking water also</p>	<p>The MWUS scheme could be economically efficient for promotion of dry season vegetable production where adequate water resources are available. However, supporting the construction of the system alone does not ensure its proper use. Assistance in production is necessary to increase farmers' productivities and income.</p> <p>To utilize the system, management is also very important. Without long-term plans and fund generation, this will not be sustainable.</p>

Pilot Project		Relevance	Results	Lessons	
			improved for 111 beneficiaries. The MWUS scheme could be economically efficient for promotion of dry season vegetable production.		
	H-4	Low Long term programs are required	Effect of vegetable seedling was not very significant. The quality of seedlings was not adequate, but the farmers still obtained higher production from the effect of other inputs. Improved seedling can increase production further, but the farmers to realize the effect may take longer training. No significant results were observed within 15 months of the pilot period since preparation of Junar sapling takes longer than that. Recommendation to grow them in longer periods was suggested to nursery farmers, but it was not accepted because of the limited land space.	It requires some time for improved seedling and sapling bring certain effects; therefore, long-term implementation is required. It also requires more improved skills to be able to obtain the technique. In that sense, priorities should be put on programs that bring more direct impact on productivities in a short time such as appropriate use of input materials.	
Vegetable Package	Fruits Package	H-5	Low adoptability	The difference between single and multiple crops both with fertilizer is not identified from the condition of the tree so far. Final result has to be waited until the measurement of the harvest is completed.	Even if the harvest result turned out to be no difference from the single crop, it should make significant difference in the long term; therefore, the practice should be included in the recommendation for further improvement.
		H-7	Too early to implement. Further development in distribution system necessary	The result was negative in efficiency in using carton boxes with current quantity of production in the SRC area. Although carton box shipment reduced the weight of the cauliflowers 30%–35% by removing extra leaves. But the actual cost of transportation was increased by using carton boxes than the traditional plastic bags. There were some positive aspects too. One is reducing damages during transportation. Another effect is that boxes protected the cauliflower from outside air from dryness or absorb and release air moisture to stabilize the humidity inside. One trader paid Rs.18/kg for the boxed ones while he was only paying Rs.10/kg for others.	Packaging agriculture produce in the carton boxes was introduced to improve the efficiency of transportation and handling; however, expected effects were not observed from this experiment. Although there were also many negative aspects, increasing the production scale will definitely improve the efficiency of transportation and so as the usage of carton boxes for packaging. The possibility of the use of carton boxes should remain for further study.

Pilot Project		Relevance	Results	Lessons
Fruit Package	H-1 H-6	Highly adoptable and visible direct impact in short term	<p>Appropriate treatment of diseases and pests and scheduled pesticide application significantly alleviated damages in the pilot trees. The leaves and branches were cleanly maintained compared to non-treated trees. Farmers understood that scheduled preventive application of pesticide is more effective and also reduce the total amount of cost than traditional practice.</p> <p>Application of fertilizers also improved fruits yield and new shoots grow on the tree. Right quantity at the right timing and spots made visible differences in yield only with affordable cost increment.</p> <p>The production cost, including materials and labor, incurred for this improvement was evaluated as affordable by all participated farmers.</p>	<p>Efforts taken in the past to improve Junar production have not yet bear fruits. Some of the issues still remain in the production process.</p> <p>The number as well as the size of the fruit is improved by proper fertilizer application. Thinning is recommended for long-term benefit, but farmers were reluctant to do so because the effect is not visible within a short period.</p> <p>The greening disease infects citrus trees, which could totally deteriorate the whole production area. The problem could reach to the SRC area anytime. The disease could be infected from soil to sapling. Some countermeasures, including establishment of more secured clean sapling facilities, adopting appropriate nursery practice, and need to be taken to protect Junar production in the area.</p>
	H-8	External condition must be developed first	Junar juice was twice sent to and tested by Chaudhary Group (CG). However, the quality of the juice was not acceptable, even for the mix-type drinks.	Stable good quality of produce is very important for processing. Junar quality in SRC needs to be improved. In addition, a Junar juice plant is under construction by Sindhuligadi Fruits Processing Pvt. Ltd, of which development should be watched.
Extra: Contract Production	Potatoes	Highly adoptable but basic condition required	The number of farmers who participated in the potato production for the CG, the volume of planted seed potatoes and areas have expanded each year: it has started with one farmer planting 50 kg of seed potatoes in one ropani field, but grew into 37 farmers planting a total of 750 kg of seed potatoes in 18 ropani field. The official contract between farmers and CG has not signed yet, but the efforts will continue.	From the third year around, no support was given by SRCAMP. Actions taken by the farmers were recognized as commercial activities.
Milk Package	L-2	High	The result showed that improving quality and quantity feeds contributes to increasing milk yield. By chopping roughage and mixing it with concentrated feeds, the feed intake was improved and may have contributed in increasing milk production. Actual measured milk yield of eight buffaloes and one cow exceeded the estimated profitable line although large deviations among individuals. These deviations were mainly caused by individual genetic difference.	<p>Efficient use of roughage would lead to cost reduction. Further improvement of economic efficiency would be possible by the introduction of an appropriate feeds formulation compatible with lactation stages and milk production.</p> <p>In the cold hill areas, like Bocha, it is recommended that farmers switch to cows from buffaloes for the improvement of dairy income.</p>

Pilot Project		Relevance	Results	Lessons
	L-4 L-5	Moderate	It became clear that even genetically superior milking buffaloes are dried off with no pregnancy and eventually are sold. In addition, no superior buffalo stud bulls has been distributed by DLSO, and farmers keep breeding using fertile buffalo bulls whose ability is not clear in the pilot area. These are seriously affecting the genetic improvement of buffaloes. In the case of cows, AI remains limited in the area. The low ratio of successful conception is a reason. Because using fertile bulls for conception remains as main services, genetic improvement of dairy animals is progressing very slowly in the area.	Genetic improvement of dairy animals is strongly recommended for the improvement of farmers' income in the SRC area.
	L-7	Low	As for the improvement of the sanitary condition, frequent replacement of bedding material improved sanitation even without shed improvement. Shed improvement, especially the floor, definitely alleviate the mastitis and improve milk quality.	It is difficult to motivate the farmers to improve the shed for sanitary reasons as it does not generate direct increase in productivity and income. Awareness programs for importance of basics sanitary condition concerning daily lactation practice may be necessary.
Milk Package Goat Package	L-3	High	Sloped and privately owned land not adequate for agricultural fields was mainly selected for the transplantation of fodder trees. Judging from the growth rate of the fast growing trees transplanted at the end of July 2012, fodder tree development is possible as long as there is no browsed damage by livestock, even where rainfall is scarce.	Availability of various fodders in the hill areas provides a large potential for feeding ruminant animals. On the other hand, labor requirement for collecting those fodders is a heavy task. Farmers expressed significant interests in planting fodders within private lands for efficient feed collection. Appropriate technical assistance for the maintenance of newly introduced fodders and more efficient feeding techniques need to be extended to the farmers. There are already a few nursery farmers in the area that could be trained to promote the program of fodder planting, which may improve the coarse feeds supply condition in the area.
	L-6	Moderate	Infection rate of LF was significantly higher in dairy animals than goats. This may be because the dairy animals are fed by more infectious rice straw and paddy grasses, while goats are mainly fed by non-infectious fodders all year round. Therefore, there is no need to worry about infection from roughage for goats. However, goats and dairy animals are kept in the same shed; it may increase the risk of infection to goats.	LF is curable by a single dose of medicine. It is recommended to perform periodic examination and medication for prevention. It is also important to avoid feeding the animals with contaminated rice straws and paddy grasses. Effects of anthelmintic, together with fecal examination and prescription, need to be tested by each district laboratory, and then extended to the public.

Pilot Project		Relevance	Results	Lessons
Goat Package	L-10	High	Only adding commercial formula feeds to the roughage based conventional feeds, weight gain worth the cost of feeds was observed. The weight gain of individual goats was significantly different. Daily gain of weights at each site was 20.8~69.3g/day in Bhimkhori, 40.4~101.9g/day in Bocha, 39.5 ~ 87.3g/day in Hattitar and 44.8 ~ 90.7g/day in Ratanchura. These differences may have been induced by the different feeding practices of each farmer, but genetic ability of individual goat may also have affected the result.	Increasing the daily weight gain of goat shortens the period of rearing until shipment, and also decreases the risk of catching diseases and accidents. It is an appropriate measure for commercial production. In order to establish the goat production techniques for commercialization in the hill areas where agriculture, livestock, and forestry are organically synchronized, it is necessary to establish a feeding technique in combination with production of high nutritious value fodder trees.
	L-9	Moderate	It became clear that even though the demand for the superior buck is high, no systematic effort is taken in selecting and producing superior male goats for breeding inside the area in these four districts. The fact that lack of interest in selecting and producing the superior male goats and delayed castration seem to have influenced on productivity of goats in the study area.	Deficiency of elite bucks is also significantly affecting the kidding interval. Therefore, the first priority should be placed on the selection of elite bucks within the area. Technical assistance through OJT by the government officers is recommended.
	L-8	Low	Many positive opinions concerning goats' health and shed cleaning were heard from the beneficiaries, but quantitative verification of the effects on productivity such as the growth rate or possible prevention of respiratory diseases by the improvement of the goat shed was impossible. The shed developed by each site was unique in design, adapting to the climate. Strengths and limitations of each shed design became clear.	The number of farmers who are willing to improve goat shed, without assistance is limited as it does not bring immediate increase in the income. Long-term approach is necessary to find out how rearing environment affects productivity. The experience from the pilot project could be utilized in the guideline for the goat shed improvement for different climates.

**The Project for the Master Plan Study
on High Value Agriculture Extension and Promotion Project
in Sindhuli Road Corridor in Nepal
(SRCAMP)**

Final Report

PART II: MASTER PLAN FOR HVC PROMOTION IN SRC

Introduction to the M/P

Part II of this report presents the M/P for the Agricultural commercialization of the study area, based on the discussions in Part I.

The M/P consists of: (1) Zoning and Development Scenarios for Identified Zones, (2) BDS, (3) Policy Matrix, (4) Project Long List, (5) Strategic Programming, and (6) A/P.

The figure shown below explains the composition and the order of contents of the master plan, as well as the chapters where they are presented.

Zoning and Development Scenarios for Identified Zones: Firstly, the results of the several zoning attempts that were carried out for the Study will be briefly explained with emphasis on the last one which is based on “accessibility” and “agro-ecological aspects” as two important axes. Secondly, based on the zoning results, the development scenarios for commercialization of the study area will be presented according to zone.

Basic Development Strategy: The development strategy for agricultural commercialization of the study area proposed by this Study will be presented. The BDS is the updated version of the DBDS that the Study has previously proposed and revised based on the results and lessons obtained from pilot projects.

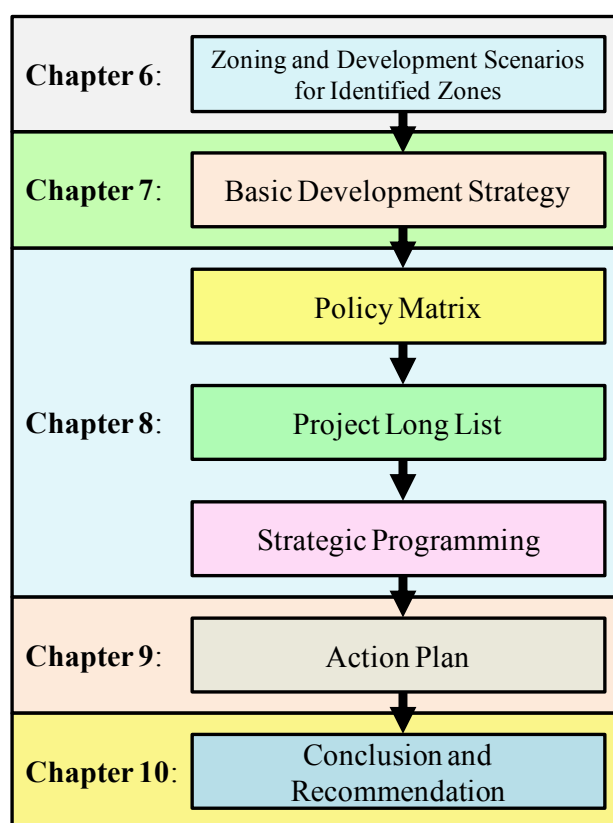


Figure: Outline of the M/P

Policy Matrix: A matrix which consists of the excerpts of long-term policy directions of Nepal that relate to agricultural commercialization, combined with proposed goal, policy, and actions, towards 2020 for the study area, will be presented.

Project Long List: A long list of projects related to agricultural commercialization of the study area, which consist of newly proposed and ongoing government projects/programs and donor supported projects, will be presented.

Strategic Programming: An analysis will be conducted on the long-listed projects, by looking into the relationship and prospective synergies among them. This will be followed by the proposal of some selected projects to be implemented with prioritization among the newly proposed projects.

Action Plan: Based on the strategic programming, the Study proposes the action plan for selected projects.

Conclusion and Recommendation: The Study will draw a conclusion for this M/P and make a recommendation for the parties concerned.

CHAPTER 6 ZONING OF THE STUDY AREA AND DEVELOPMENT SCENARIOS FOR IDENTIFIED ZONES

6.1 Zoning of the Study Area

6.1.1 Background and Objective for Zoning

The agro-ecological condition of the study area is quite diverse and the productive use of agricultural lands requires adoption of strategies compatible with their intricate topography and slope. Selection of high value commodities for promotion of agricultural commercialization should also be based on the considerations of ecological conditions and local situation. Recognizing these, zoning of the study area has been carried out to identify areas with high prospects of agricultural commercialization using various types of information. The main purpose of zoning under the Study is to identify the different locations in the study area suitable for commercialization by producing high value commodity through utilizing both spatial and attribute data.

6.1.2 Several Attempts of Zoning Conducted under SRCAMP⁴⁸

During the implementation period of SRCAMP, three attempts for zoning have been carried out.

(1) First Zoning Attempt

The “*First*” attempt was conducted from October to November 2011 based on land use, agro-ecological conditions, slope, road access, existence of officially designated production pockets, and future strategic road network development plan. The VDCs/municipalities were taken as unit of analysis because it is the lowest political administrative unit of Nepal.

The first zoning attempt was conducted based on spatial and attributes analyses in the geographic information system (GIS) domain. However, the farming system in Nepal is complex as the same unit of land is used for multiple purposes, and it is very difficult to identify areas suitable for a single specific high value commodity or livestock. Hence, VDCs separately endowed with commercialization potential for vegetables and fruits (based mainly on slope condition, i.e., $<15^\circ$ for vegetables and $30>15^\circ$ for fruits) were first identified by the Study. Likewise, VDCs having commercialization prospects for livestock were identified (based mainly on vegetation cover, i.e., $<20\%$ for swine/poultry, $20<50\%$ for dairy, and $>50\%$ for goat). Later on, maps of the commercialization potential of vegetables, fruits, and livestock expressed according to the borders of VDCs/municipalities were prepared.

(2) Second Zoning Attempt

The “*Second*” attempt was conducted from January to February 2012 in response to the request raised by counterparts appealing that, although it is officially published, the existing information of the DADO/DLSO production pockets for both existing and future potentials are unreliable, and the new data collection should be carried out based on wards as the unit of analysis instead of VDCs.

⁴⁸ For the details of first, second and third zoning attempts, please refer SN 4 in the Volume II.

The second zoning attempt was conducted relying mostly on data collected from consultative meetings with district stakeholders. A series of consultative meetings were carried out with the district stakeholders, especially government officials in all four study districts, in order to understand the existing status of agricultural commercialization and future prospects together with the availability of support services for agricultural commercialization. As a result, a series of existing and potential pockets maps expressed with ward administrative borders were produced.

Results of the second zoning attempt were based solely on the primary information provided by workshops' participants who are mainly the front line extension workers of both DADOs and DLSOs. Therefore, they can be regarded, to some extent, reliable with the limitation that they are all based on the subjective observations and judgments of the workshops' participants, probably mixed with their anticipations and aspirations.

At this point, the Study Team decided to carry out another set of zoning exercise, drastically changing the approach. While the outputs produced by previous zoning exercises can be useful to consider the suitability of some HVCs in particular parts of the study area, their powers of conviction are still judged weak for master planning. Hence, the Study Team decided to treat the results of the first and second zoning attempts as supporting data that future development practitioners may refer to in their practice.

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At this point of work, the study team decided to carry out another set of zoning exercise with drastically changing the approach. While the outputs produced by previous zoning exercises can be useful to consider the suitability of some HVCs in particular parts of the study area, their powers of conviction are still judged weak for master planning. Hence, the study team decided to treat the results of the first and second zoning attempts as the supporting data for future development practitioners to refer in their practice.

(3) Third Zoning Attempt

The **“Third” attempt** was conducted from July to September 2013, due to the consideration that despite two zoning attempts conducted, the applicability of results were considered unsatisfactory for master plan formulation. In the third attempt, a drastic change in approach was introduced by putting particular emphases on accessibility and agro-ecological aspects.

In the following sections, the process and results of the third zoning attempt conducted under SRCAMP are briefly presented.

6.2 Zoning for the M/P

6.2.1 Method for the Zoning

Unlike the first and second zoning attempts, the third round zoning adopted the accessibility aspect as the primary variable, combined with the agro-ecological aspect as secondary variable. The accessibility aspect has surfaced as the fundamental and necessary condition for agricultural commercialization during the preparation stage of the DBDS, while the agro-ecological aspect is found useful in considering the seasonality (i.e., cropping calendar and/or varieties) of the production in the identified pockets.

Based on the abovementioned notion, **the Study aimed at classifying the agricultural lands in the study area using two axes, i.e., “accessibility level” and “agro-ecological regions.”**

The VDCs/municipalities and wards have been analyzed in order to better understand the existing status of agricultural commercialization in the intricate terrain of the study districts. The GIS was applied in order to conduct the spatial and query-based analysis.

The Study initially conducted the zoning of agricultural land considering the agro-ecological aspect (i.e., land use, climatic region, land capability, and soil texture) prior to the identification of potential production pockets considering the accessibility situation.

The following sequence consists of a total of eight steps applied for zoning, within which five steps are for agricultural lands and three steps are for accessibilities.

Zoning of agricultural lands: This aimed at identifying different agricultural production zones/pockets considering the agro-ecological characteristics by VDCs/wards. Different spatial data such as land use, climatic region, land capability, and soil texture maps were applied.

Step I: Clip out agricultural lands from the land use map (Map 8.1);

Step II: Classify agricultural lands into different climatic regions (Map 8.3) by overlaying the agricultural land map with the map of climatic regions (Map 8.2);

Step III: Identify agricultural land suitable for cultivation based on land capability classes by overlaying Map 8.3 with the land capability map and clipping out land capability classes I, II, and III to identify the agricultural area suitable for cultivation;

Step IV: Identify the agricultural land suitable for cultivation based on soil texture by overlaying the map created in the previous step with the soil texture map and clipping out the agricultural lands having certain soil types suitable for cultivation (Map 8.4); and

Step V: Overlay agricultural land map suitable for cultivation (Map 8.4) with administrative boundary map and produce a new map (Map 8.5).

Identification of potential production pockets based on the accessibility situation: This intends to identify the different production pockets for commercialization based primarily on the accessibility situation. The steps involved are as follows:

Step VI: Create a 500 m buffer on either side of the existing and future road network development map (Map 8.7) based on the existing and future road network development map (Map 8.6);

Step VII: Overlay agricultural zone map (Map 8.5) with the road network and buffer map (Map 8.7) and classify the agricultural area considering accessibility situation (Map 8.8); and

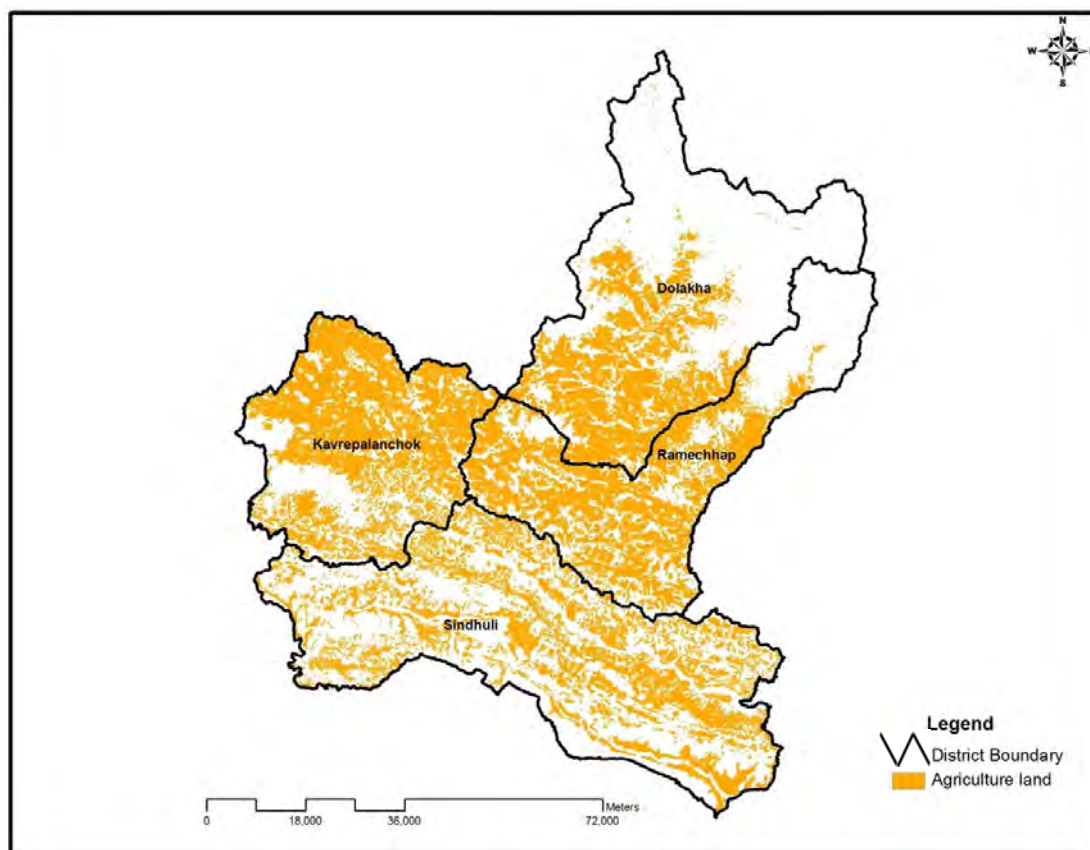
Step VIII: Produce maps showing (a) accessible pockets and (b) likely accessible pockets by district and climatic region (Map 8.10 and Map 8.11).

6.2.2 Zoning of Agricultural Lands

(1) Step I: Clip Out of Agricultural Lands from the Land Use Map

The 1996 land use map of the Department of Survey is the only latest official land use map available in Nepal. With the help of GIS tools, the agricultural land (cultivated area) of the study districts was clipped out for further analysis. Map 6.1 presents the agricultural lands. The total agricultural land of the study districts is 234,688 ha, varying from 65,774 ha in Kavre to 51,716 ha in Dolakha.

Map 6.1: Agriculture Lands in the Study Districts



Source: Study Team (based on Land Use Map, Department of Survey, 1996)

(2) Step II: Classify Agricultural Lands by Climatic Regions

Wide altitudinal variations and diverse climatic conditions resulted into seven climatic regions in the study districts. Table 6.1⁴⁹ presents the definition of climatic region and zones whereas Map 6.2 shows the different climatic regions.

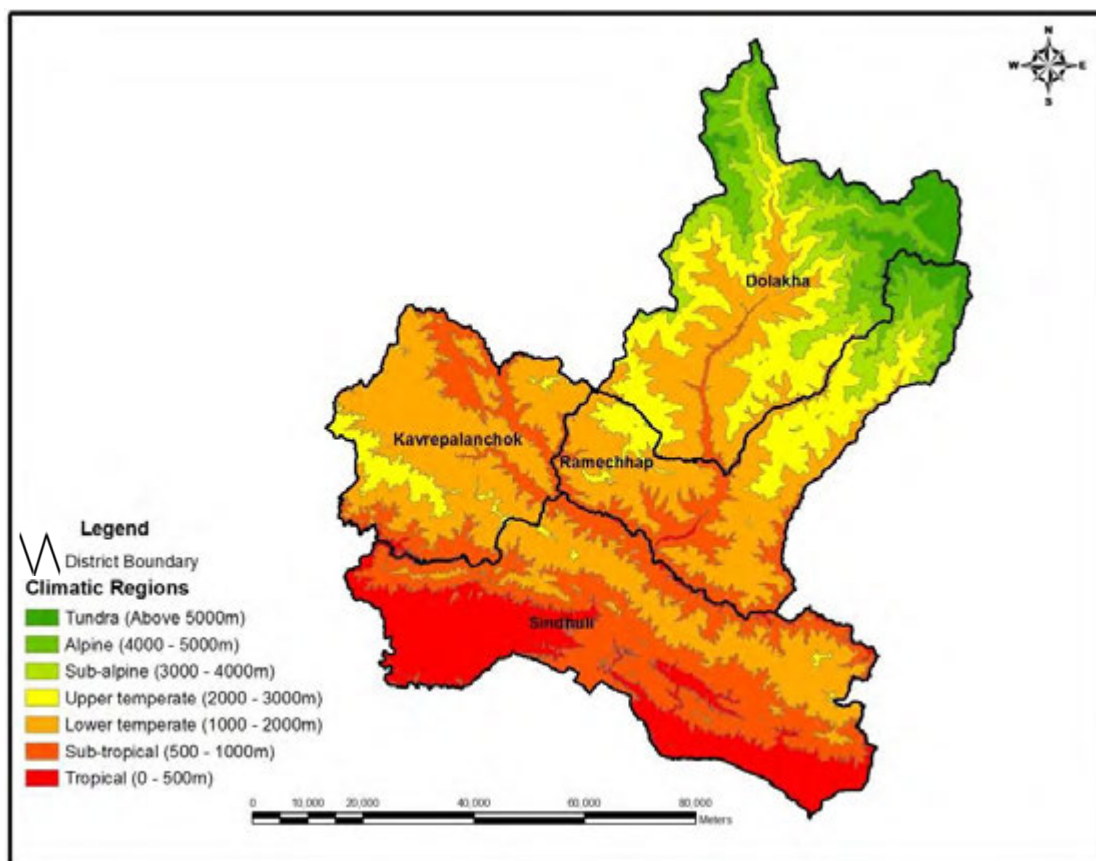
Table 6.1: Definition of Climatic Regions

Climatic region	Elevation (m)	Zone
Tundra	Above 5,000	High Himal
Alpine	4,000 – 5,000	High Mountains
Sub- Alpine	3,000 – 4,000	
Upper temperate	2,000 – 3,000	Upper Mid Hills
Lower temperate	1,000 – 2,000	Lower Mid hills
Subtropical	500 – 1,000	Low Lands
Tropical	Below 500	

Source: LRMP, 1986

⁴⁹ The physiographic regions commonly applied in Nepal (based on ICIMOD classification) was not adopted for the zoning, since it classifies middle mountains (1,000–2,000 m) as one category.

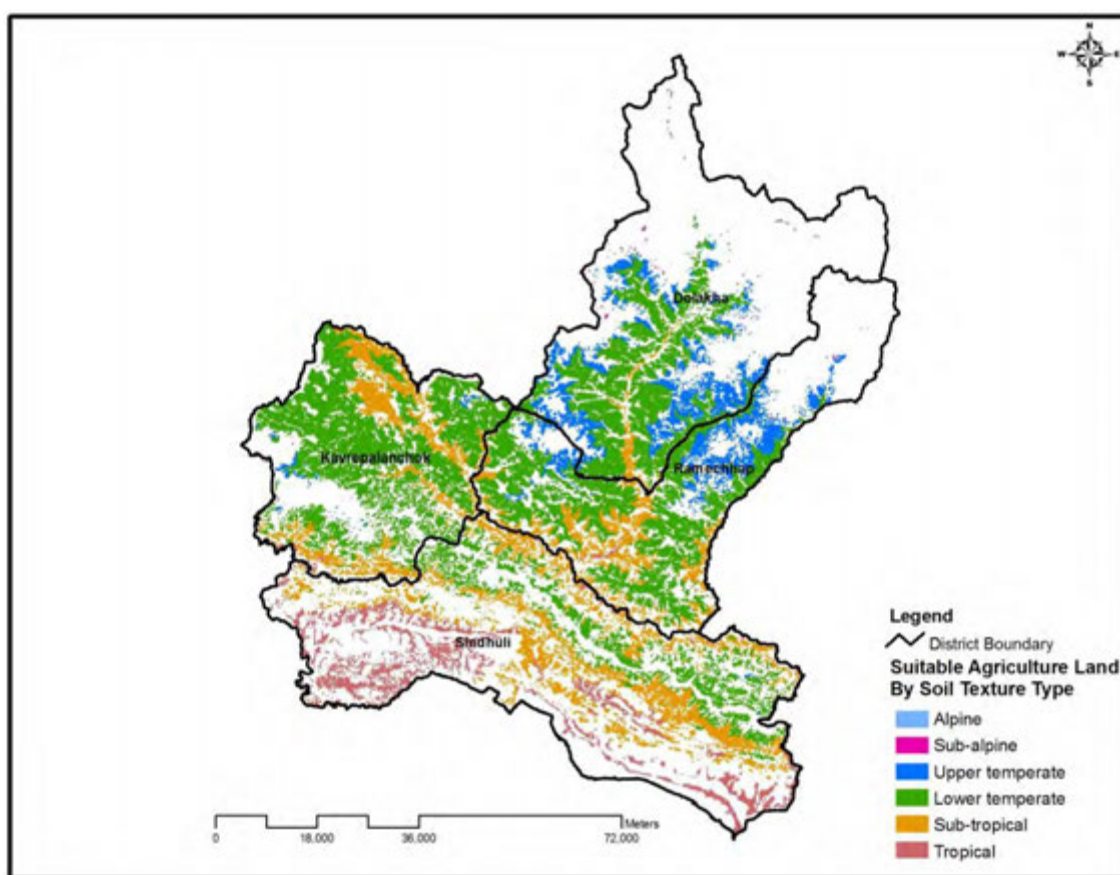
Map 6.2: Climatic Regions in the Study Districts



Source: Climatic region map (computed based on altitude), Department of Survey (1996)

The agricultural area map (Map 6.1) is overlaid with the climatic region map (Map 6.2) and spatial analysis was carried out in order to classify cultivation areas by different climatic regions. Of the total agricultural area in the study districts, more than half falls under lower temperate region (57.4%), followed by the subtropics (21.1%) and upper temperate (12.1%). Map 6.3 presents the cultivation area by climatic region. Table 6.2 presents the cultivation area by districts.

Map 6.3: Agricultural Lands in the Study Districts by Climatic Regions



Source: Study Team

Table 6.2: Agriculture Lands in SRC Districts by Climatic Regions (ha)

Climatic region	Kavre	Dolakha	Ramechhap	Sindhuli	Total	% of Total
Alpine		31			31	0.01
Sub-alpine		172	40		212	0.09
Upper temperate	992	16,708	10,573	75	28,347	12.08
Lower temperate	49,302	33,292	37,505	14,700	134,799	57.44
Sub-tropical	15,087	1,513	10,358	22,616	49,575	21.12
Tropical	393		381	20,950	21,724	9.26
Total	65,774	51,716	58,857	58,341	234,688	100.00

Source: Study Team

(3) Step III: Identify Agricultural Lands by Climatic Region Suitable for Cultivation based on Land Capability Condition

Land capability is defined as the inherent capacity of land to be productive under sustained use and specific management methods. According to the Land Capability Classification (Department of Survey, 1996), the study area can be classified into seven capabilities⁵⁰. Classifications I to III are considered suitable for cultivation with small improvements on land management practices while the rest are

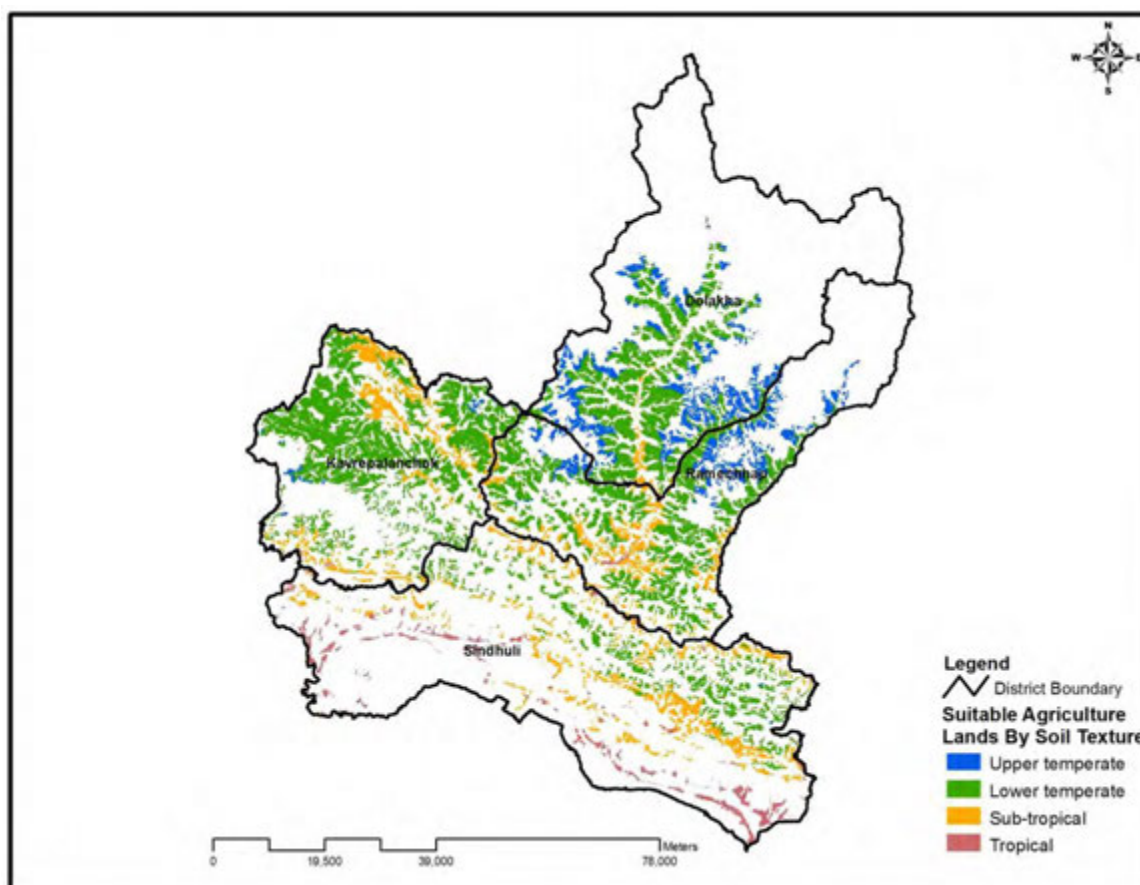
⁵⁰ Lands are classified mainly based on the degree of slopes (e.g., Classes I: <1°, II: 1°<5°, III: 5°<30°, IV: >30°, VI: 40°<50°) combined with soil depth and land surface such as rocks and ice. For details, see Volume II, Zoning, Table 13.

unsuitable for agricultural use. Hence, the Study clipped out land capability classes I to III from the land capability map. By overlaying the maps created previously, a map was created showing the lands suitable for cultivation according to land capability classes with climatic regions.

(4) Step IV: Identify Agricultural Lands by Climatic Region Suitable for Cultivation based on Land Capability Condition and Soil Texture

Soil texture indicates relative content of particles of various sizes, such as sand, silt, and clay in the soil. The Land System Map (Department of Survey, 1986) classified the soil texture into nine categories from loamy to rocks, and defined the fragmental loamy, fragmental sandy, loamy, loamy skeletal, and loamy boulder as suitable for cultivation while the rest are considered as unsuitable. Therefore, the Study clipped out the soil texture from fragmental loamy to loamy boulder from the soil texture map. By overlaying the map created previously, a map showing the lands suitable for cultivation based on land capability for cultivation and soil texture was created (Map 6.4).

Map 6.4: Agriculture Lands Suitable for Cultivation based on Land Capability for Cultivation and Soil Texture

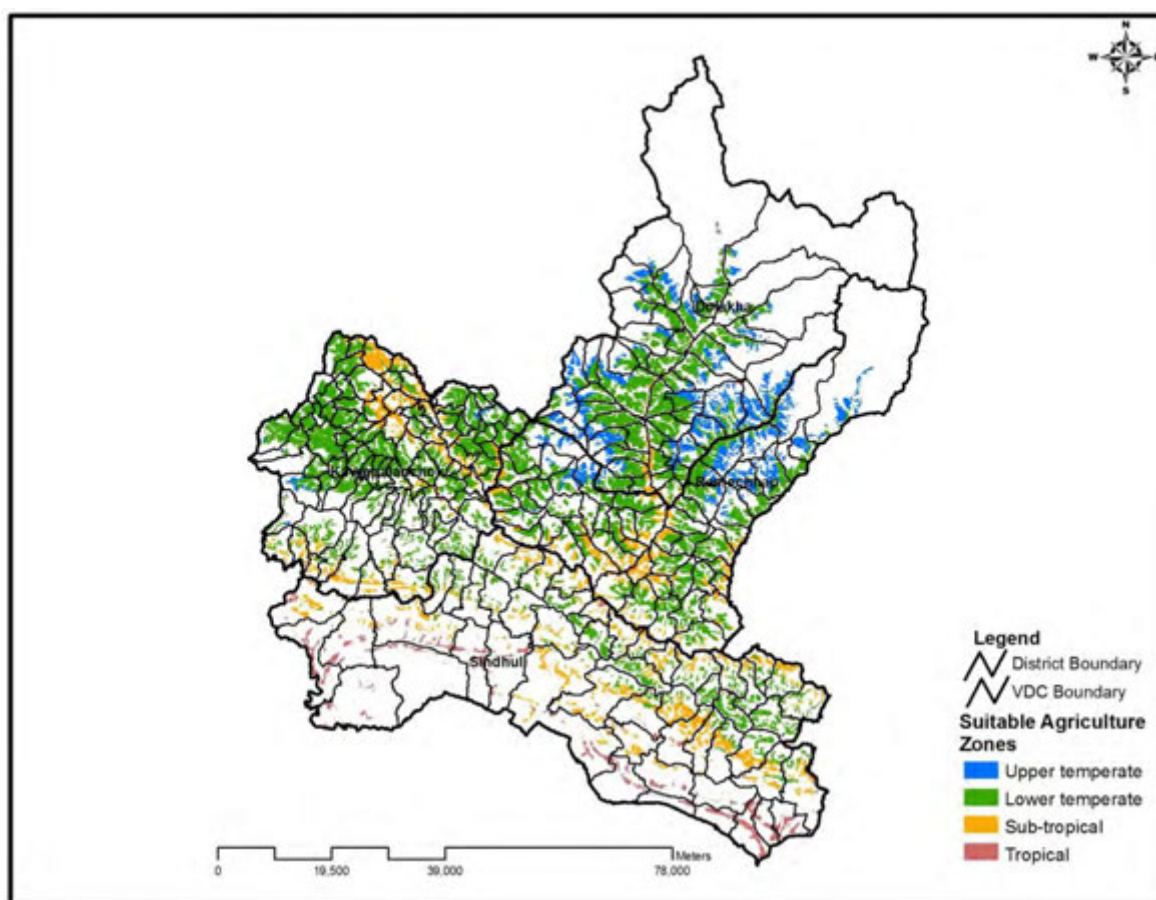


Source: Study Team

(5) Step V: Overlay Agricultural Zone Map (Map 19) with Administration Border Map

Map 6.4 was further overlaid with the administration border map to identify agricultural zones belonging to different climatic region by wards and VDCs (Map 6.5).

Map 6.5: Agriculture Lands Suitable for Cultivation by Climatic Region and VDCs



Source: Study Team

The total agricultural land suitable for cultivation in the study area is 138,640 ha varying from 23,395 ha in Ramechhap to 42,211 ha in Kavre. Of the total agricultural lands suitable for cultivation based on land capability and climatic region, a large proportion falls under lower temperate region (65%), followed by subtropical (16.9%), and upper temperate region (13.5%). Table 6.3 presents the cultivation area by districts.

Table 6.3: Agriculture Lands Suitable for Cultivation (ha) by Climatic Region

Climatic region	Kavre	Dolakha	Ramechhap	Sindhuli	Total	% of Total
Upper temperate	662	11,789	6,278	35	18,764	13.5
Lower temperate	33,720	24,038	24,304	8,082	90,145	65.0
Sub-tropical	7,758	744	5,601	9,373	23,475	16.9
Tropical	71	-	280	5,905	6,256	4.5
Total	42,211	36,571	36,463	23,395	138,640	100.0

Source: Study Team

6.2.3 Zoning for the Identification of Potential Production Pockets

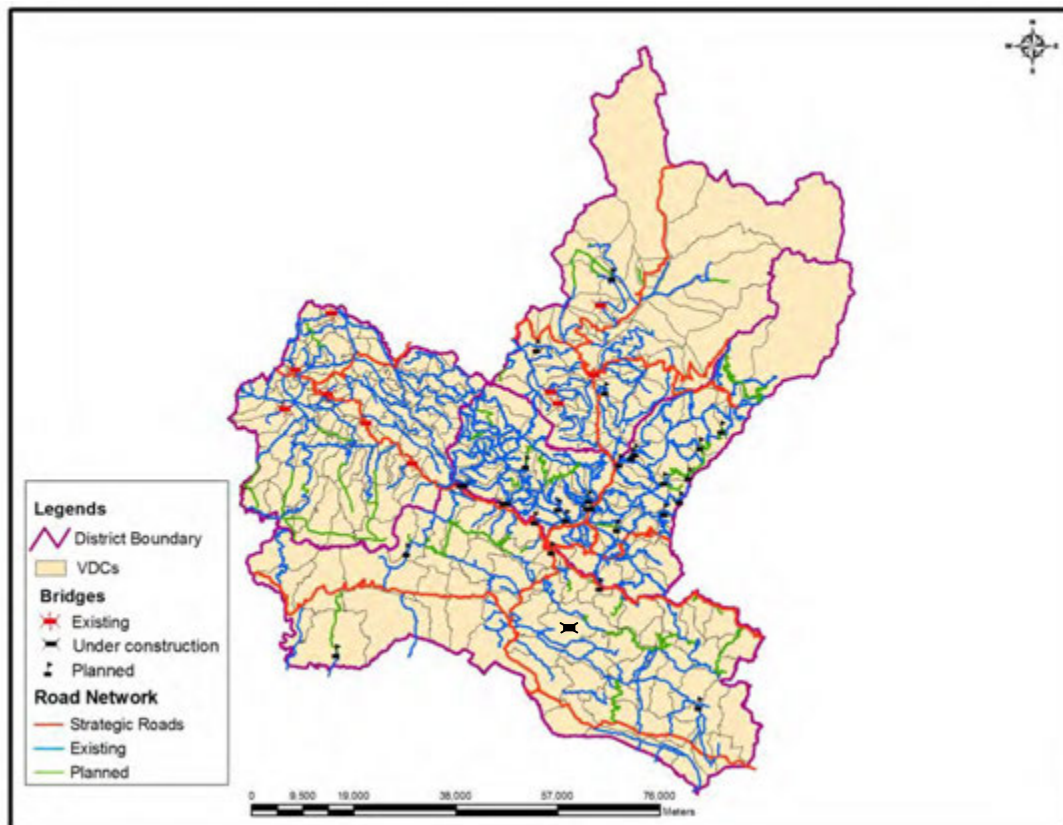
The spatial analysis was conducted for the identification of potential production pockets. Spatial data was obtained from the Department of Survey and also, digitized from the District Transport Master Plans (DTMPs) of respective districts. The step-wise methodology and outcome of each step are

presented in the following sections:

(6) Step VI: Create a 500 m Buffer on Either Side of the Existing and Future Road Networks

The latest road network maps (existing and future status) were digitized from DTMPs of each district. Map 6.6 presents the district road network map of the study districts. This map shows both existing strategic road and local road networks.

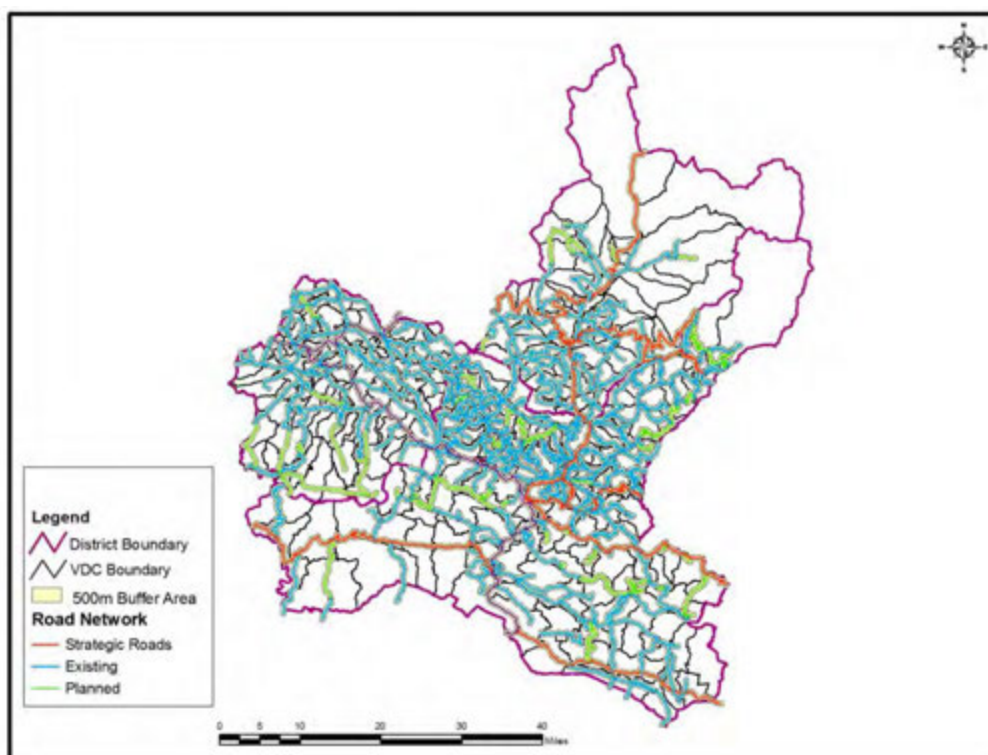
Map 6.6: Existing and Future Road Network with Bridges



Source: Study Team (based on DTMPs of each district)

After the preparation of the road network map, a 500 m buffer on either side of the roads was carried out, in order to identify the impact zone of accessibility improvements for the agricultural commercialization. Map 6.7 presents the road network map showing the 500 m buffer area on either side of the roads.

Map 6.7: Existing and Future Road Network with 500m Buffer Area on Either Side of the Road



Source: Study Team (based on DTMPs of each district)

(7) Step VII: Classify Agricultural Lands Considering the Accessibility Situation

The road network buffer map (Map 6.7) was overlaid with the agricultural production zone map (Map 6.5). The spatial analysis was carried out and the agricultural land was further classified into three categories considering the accessibility situation. The accessibility situation has taken into consideration the bridges as well as roads which are being constructed along the SRC. The three categories are as follows:

- **Accessible agricultural pockets:** These include those agricultural lands connected within the 500 m buffer from either side of the existing road. These exclude those agricultural lands lying beyond the 500 m buffer of the road even if the area formed a contiguous cluster with accessible pockets.
- **Likely accessible agricultural pockets:** These include those agricultural lands within the 500 m buffer from either side of the planned road where there is no road connection at present. However, construction of a road will likely happen in the near future. These exclude those agricultural lands lying beyond the 500 m buffer of the road even if the area formed a contiguous cluster with likely accessible pockets.
- **Inaccessible agricultural area:** This includes those agricultural lands beyond the 500 m buffer from either side of the road. The Study considered them as inaccessible pockets since there is no road or other means of accessibility at present. Likewise, these areas have no prospects of road construction within the next five years according to DTMPs.

Map 8.8 in the following page and Table 6.4 below show the accessibility of agricultural lands suitable

for cultivation. Of the total agricultural lands suitable for cultivation in the study districts, 75,371 ha (54.4%) are accessible, 4,677 ha (3.4%) are likely accessible, and 58,592 ha (42.3%) are inaccessible. Nearly half of the cultivation land is accessible in all the districts varying from 40.8% in Sindhuli to 66.1% in Ramechhap. The inaccessible area is relatively high in Sindhuli followed by Kavre and Dolakha.

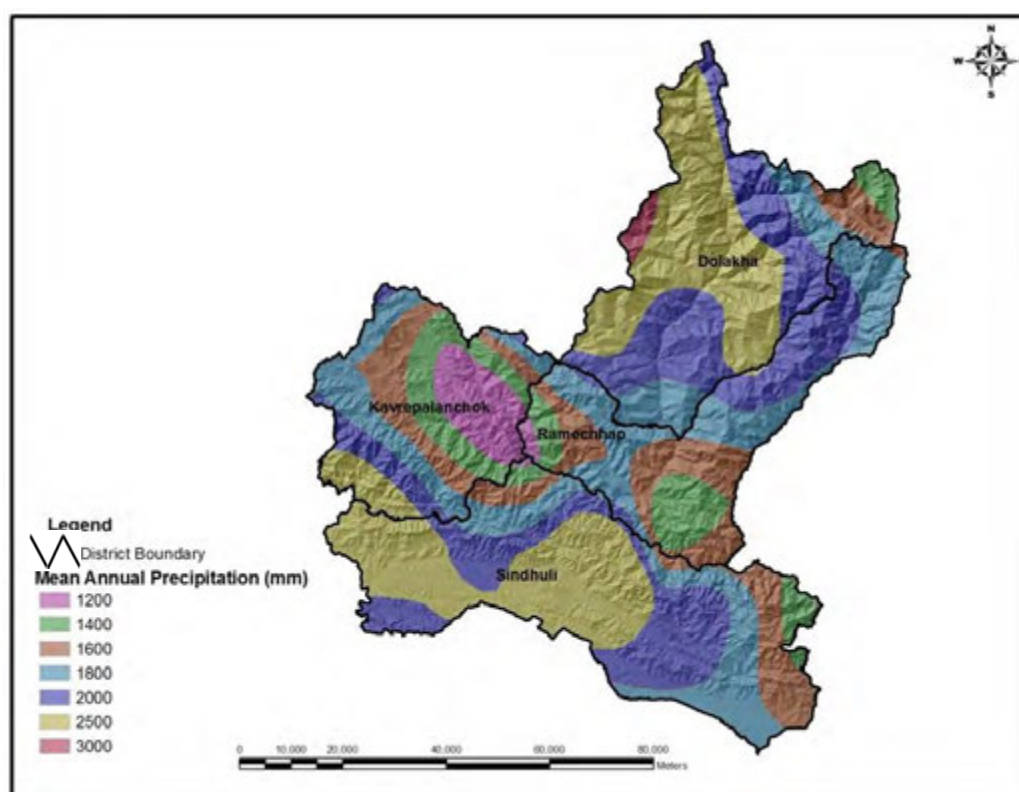
Table 6.4: Accessibility Situation of Agriculture Lands in the Study Districts

District	Accessible Agriculture Area		Likely Accessible Agriculture Area		Inaccessible Agriculture Area		Total	
	Area (ha)	%	Area (ha)	%	Area (ha)	%	Area (ha)	%
Kavre	21,906	51.9	1,433	3.4	18,872	44.7	42,211	100.0
Dolakha	19,835	54.2	668	1.8	16,068	43.9	36,571	100.0
Ramechhap	24,095	66.1	1,398	3.8	10,970	30.1	36,463	100.0
Sindhuli	9,535	40.8	1,178	5.0	12,682	54.2	23,395	100.0
Total	75,371	54.4	4,677	3.4	58,592	42.3	138,640	100.0

Source: Study Team

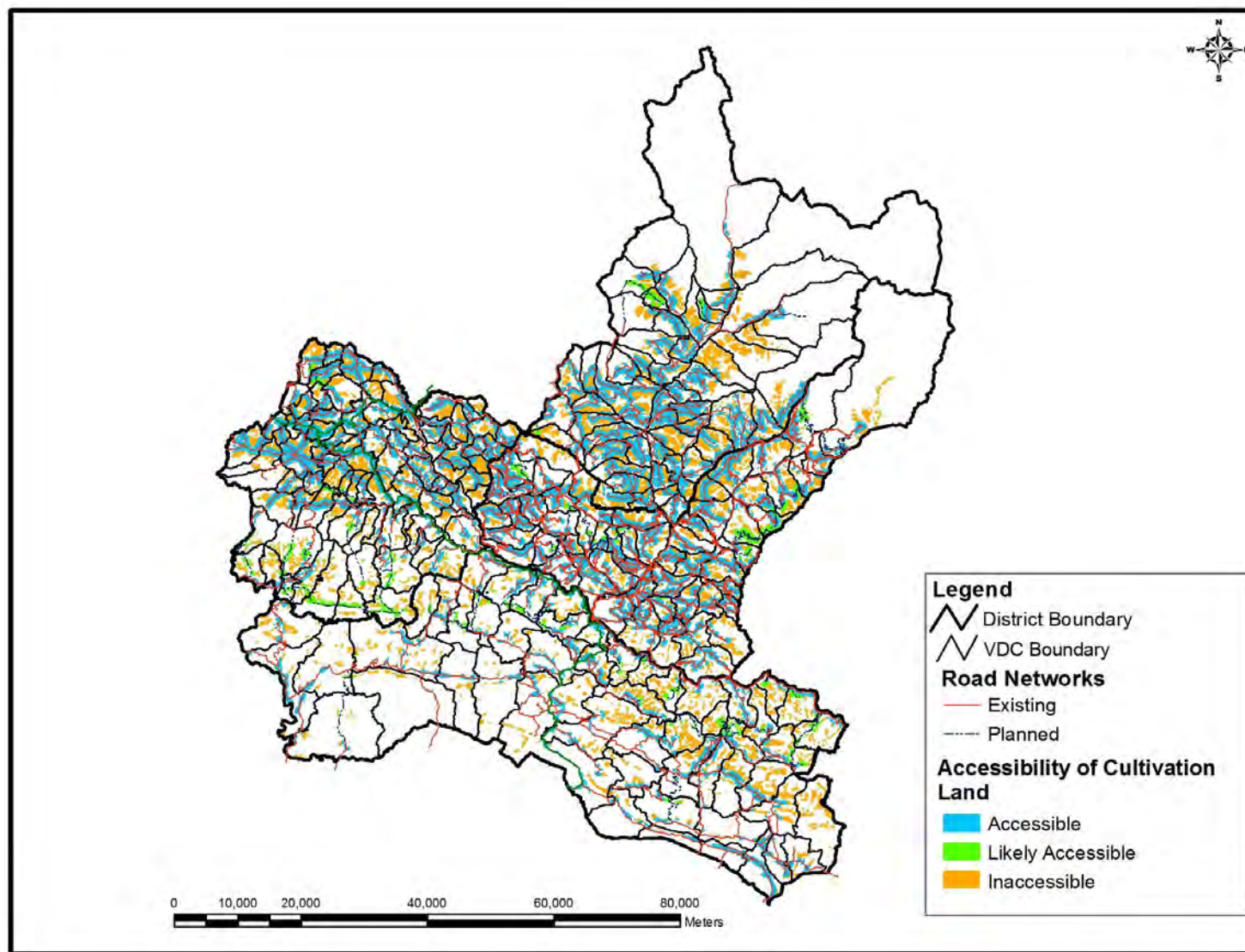
Map 6.9 presents the precipitation distribution in the study districts. This is the only available data for precipitation but the accuracy is considered low. Therefore, this map should be regarded as referential data only. Water availability rely very much on the existence of perennial water sources and their volumes, thus, this aspect needs to be checked on the ground for each pockets.

Map 6.8: Precipitation Distribution of the Study Districts



Source: ICIMOD, 2009

Map 6.9: Accessibility Situation of Agricultural Lands Suitable for Cultivation



Source: Study Team

(8) Step VIII: Classify Accessibility by Climatic Regions

The map obtained from Step II (Map 6.9) was further classified based on climatic regions. Table 6.5 presents accessible and likely accessible cultivation areas by climatic regions. Majority of the accessible pockets fall under the lower temperate region (50,221 ha) followed by subtropical (12,225 ha), and upper temperate region (9,008 ha).

Table 6.5: Accessibility Situation of Agricultural Lands by Climatic Region

Climatic Zone		Accessible Agriculture Area		Likely Accessible Agriculture Area		Inaccessible Agriculture Area		Total	
		Area (ha)	%	Area (ha)	%	Area (ha)	%	Area (ha)	%
Upper temperate (2,000–3,000 m)	Area (ha)	9,008	48.0	543	2.9	9,213	49.1	18,764	100.0
	%	12.0		11.6		15.7		13.6	
Lower temperate (1,000–2,000 m)	Area (ha)	50,221	55.7	3,172	3.5	36,751	40.8	90,145	100.0
	%	66.6		67.8		62.7		65.0	
Subtropical (500–1,000 m)	Area (ha)	12,225	52.1	887	3.8	10,363	44.1	23,475	100.0
	%	16.2		19.0		17.7		16.9	
Tropical (0–500 m)	Area (ha)	3,917	62.6	74	1.2	2,265	36.2	6,256	100.0
	%	5.2		1.6		3.9		4.5	
Total	Area (ha)	75,371	54.4	4,677	3.4	58,592	42.2	138,640	100.0
	%	100.0		100.0		100.0		100.0	

Source: Study Team

Table 6.6 presents the district's specific situation by accessible agricultural lands and climatic region.

Table 6.6: Accessible and Likely Accessible Agriculture Lands by Climatic Regions

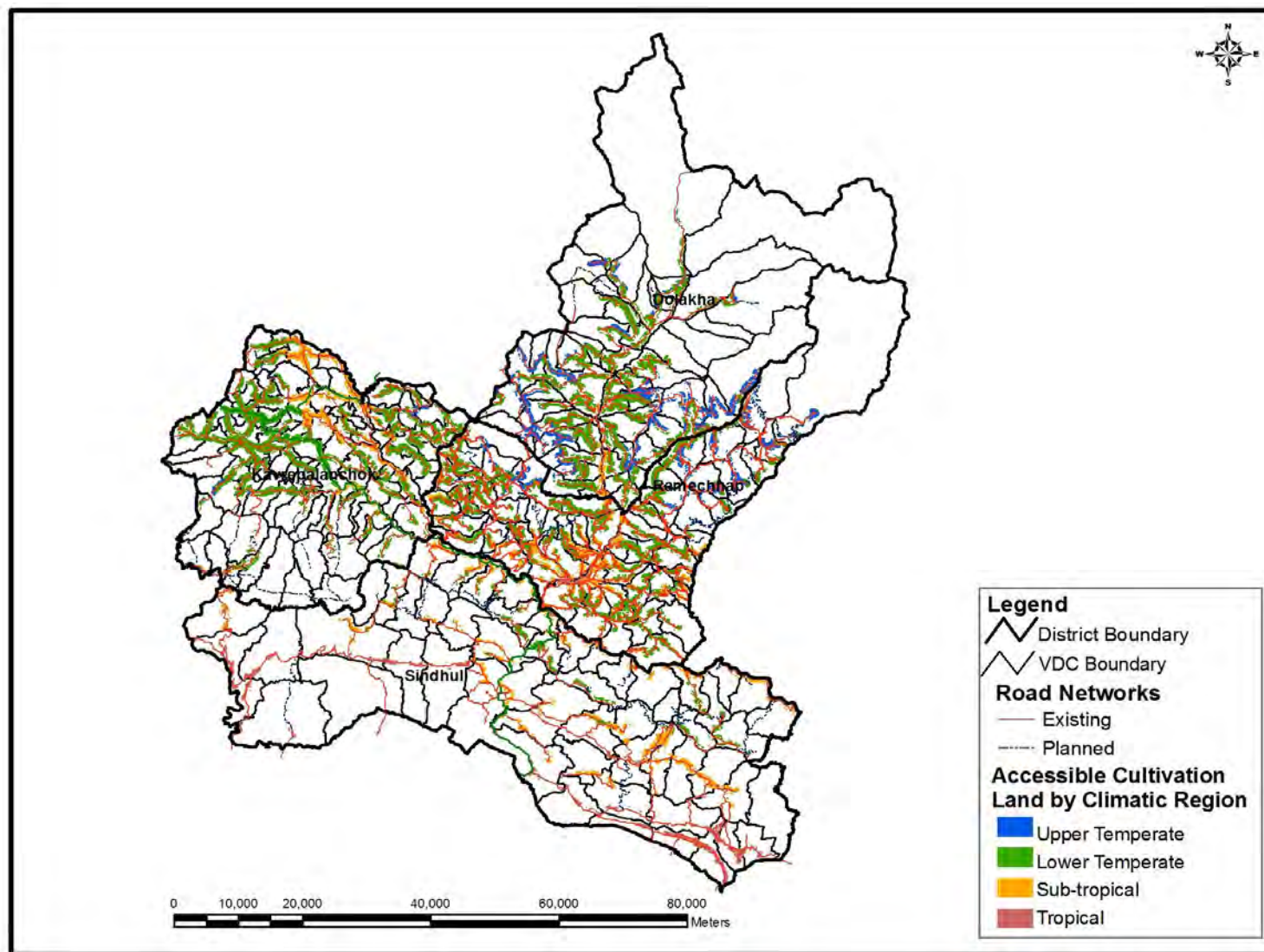
District	Climatic Region	Accessible Agricultural Area (ha)	Likely Accessible Agricultural Area (ha)
Kavre	Upper temperate(2,000–3,000 m)	369	5
	Lower temperate (1,000–2,000 m)	17,617	795
	Subtropical (500–1,000 m)	3,893	607
	Tropical (0–500 m)	26	27
	Subtotal	21,906	1,433
Dolakha	Upper temperate(2,000–3,000 m)	5,720	355
	Lower temperate (1,000–2,000 m)	13,662	313
	Subtropical (500–1,000 m)	454	-
	Tropical (0–500 m)	-	-
	Subtotal	19,835	668
Ramechhap	Upper temperate(2,000–3,000 m)	2,901	183
	Lower temperate (1,000–2,000 m)	16,949	1,207
	Subtropical (500–1,000 m)	3,981	7
	Tropical (0–500 m)	265	-
	Subtotal	24,095	1,398
Sindhuli	Upper temperate(2,000–3,000 m)	18	0
	Lower temperate (1,000–2,000 m)	1,994	857
	Subtropical (500–1,000 m)	3,897	273
	Tropical (0–500 m)	3,626	48
	Subtotal	9,535	1,178
Total		75,371	4,677

Source: Study Team

Maps 6.10 and 6.11 present the accessible and likely accessible agricultural lands suitable for cultivation by climatic regions and districts, respectively. Comparing these two maps, the likely accessible agricultural lands in the study area are not much because the data that the Study utilized for the planned road construction cover until 2018 only.

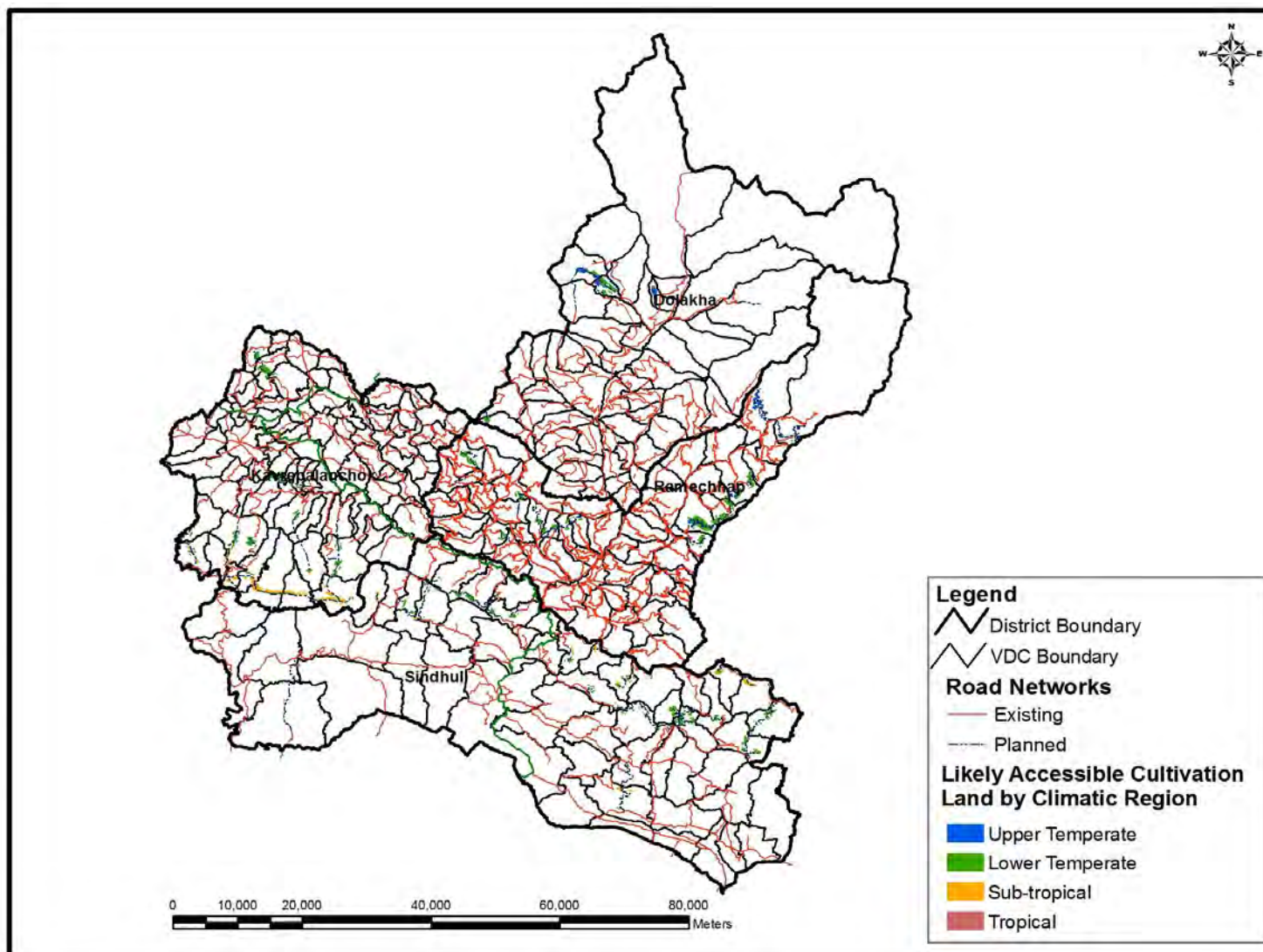
Likewise, Maps 6.10 and 6.11 below show the accessible agricultural lands by study districts, VDCs, and climatic region.

Map 6.10: Accessible Agricultural Lands Suitable for Cultivation by Climatic Regions



Source: Study Team

Map 6.11: Likely Accessible Agricultural Lands Suitable for Cultivation by Climatic Regions



Source: Study Team

6.3 Development Scenarios for Identified Zones

6.3.1 Application of the Zoning Results for the M/P

The results of the zoning attempts presented in the previous sections focused on the accessibility aspect, which is generally considered as the fundamental and primary condition necessary for agricultural commercialization, as it is widely claimed and also emphasized in the formulation process of the DBDS. Although there are exceptions, such as some kind of NTFPs that can be light in weight, small in size, storable for a certain time, and transportable without road networks. Given that the major premise of this Study is based on maximizing the benefits of accessibility improvement associated with the Sindhuli Road construction. Hence, focusing on the accessibility aspect in zoning is considered appropriate.

While these zoning results did not clearly delineate the particular zones shown with circles or colors with particular characteristics and recommend producing particular HVC, the Study believes that this zoning is comparably more practical. Because designating particular pockets for particular HVC is virtually impossible due to highly intricate terrains and wide variety of agro-climatic conditions in the study area. Furthermore, it is considered impractical even if one forcedly creates such. The Study concluded that the selection of a particular HVC for particular pockets should be decided based on the careful assessment of market signals as against various related conditions, e.g., accessibility, lands, water, climate, and labor.

Some shortfalls exist in this zoning results due mainly to the accuracy and reliability of the data used. As it was explained previously, the reliable precipitation data of the study area did not exist while it could be an important aspect for zoning. Another inaccuracy could be related to the proportion balance between the existing road (accessible zone) and planned road (likely accessible zone). It is understandable with the existing road network since the accumulated results of the construction works during the past several decades certainly exceeds that of the mere five-year planning period of DTMPs. However, it should be noted that even within the existing roads category, there are many routes that are unreliable for constant transportation. Although it is widely known that not even a small portion of the existing rural roads become impassable after heavy rains due to makeshift constructions which is popularly observed in Nepal, the data classifying the stability or impassability of the existing rural roads are not available.

Hence, the zoning results that classify the agricultural lands in the study area based on two axes, i.e., accessibility and agro-ecological aspects, should be regarded with a condition that the accessibility aspect need to be rechecked before entering into concrete actions. Moreover, the agricultural commercialization activities should be implemented along routes with stable road conditions as a priority.

Despite some shortfalls explained above, the zoning under the Study enabled the general understanding of the accessibilities and various types of agricultural lands distributed within the study area. For the next step, it is proposed to strategically plan and implement the agricultural

commercialization activities along the routes based on the stability of transportation, aggregate size of agricultural lands, and considerations of the climatic aspects. These will progressively transform the area into one of the important production centers of HVCs.⁵¹

The results of the first and second zoning attempts that are not applied in the abovementioned discussions can be referred to when the actual commercialization activities take place, because the information included in those results are considered useful in considering the adequacy or potential of particular areas for commercialization.

6.3.2 Development Scenarios for Each Identified Zones

The zones identified based on two axes, i.e., accessibility and agro-ecological aspects, can be divided into a maximum of 12 zones (three for accessibility and four for climatic regions). However, in view of its practical use, the 12 zones are further grouped into five zones as follows:

Zone 1: Accessible/Temperate (by merging the upper and lower temperate climates);

Zone 2: Accessible/Subtropical (by merging tropical and subtropical climates);

Zone 3: Likely Accessible/Temperate (same as Zone 1);

Zone 4: Likely Accessible/Subtropical (same as Zone 3); and

Zone 5: Non-accessible (by merging all four climates).

The abovementioned simplification was applied for zoning for the following reasons: (i) for climatic regions where both lower and upper temperate climates are considered eligible to produce off-season vegetables in a broad sense, (ii) for tropical and subtropical tropical climates where the same logic can be applied as they are both ineligible to produce off-season vegetables, (iii) for non-accessible area where disregard of climatic regions was applied because inaccessibility virtually limits the opportunity for agricultural commercialization in a general sense, and (iv) for other options where inaccessible areas are appropriate to be merged into one.

The scenarios for the development of each zone aiming at agricultural commercialization under this M/P were also deliberated in line with accessibility and agro-ecological aspects. As a result, they turned out to be rather simple scenarios.

Table 6.7 presents the zoning of the study area according to accessibility and agro-ecological aspects, with the proposed development scenarios for agricultural commercialization towards 2020.

⁵¹ The data compiled for the next step (for actual implementation) consist of route codes and road names in DTMPs, lengths, and number of pockets, and the aggregate size of agricultural lands by climatic regions along the route, are attached as part of Section 3 in Volume II.

Table 6.7: Zoning of the Study Area with the Proposed Development Scenarios for Agricultural Commercialization towards 2020

	Accessible (area with year-round accessibility)	Likely Accessible (including area with seasonal roads)	Not Accessible (area with no prospects for access improvement until 2020)
Pockets in Temperate Climate	Zone 1: Accessible/Temperate	Zone 3: Likely Accessible/Temperate	Zone 5: Not Accessible
	Proposed Scenario: By taking advantage of temperate climate, strive to develop as the reliable production area of off-season crops.	Proposed Scenario: Join to the Zone 1 category when accessibility is improved.	Continue subsistence agriculture while taking advantage of forestry resources where possible, by striving for Non-Timber Forest Product (NTFP) production and goat rearing through community forestry type activities.
Pockets in Subtropical Climate	Zone 2: Accessible/Subtropical	Zone 4: Likely Accessible/Subtropical	
	Proposed Scenario: By taking advantage of relative competitiveness in accessibility, strive to develop as the reliable production area of vegetables.	Proposed Scenario: Join to the Zone 2 category when accessibility is improved.	

Source: Study Team

The main pillar of the scenarios presented above is accessibility as it has been repeatedly emphasized in this Study to be the fundamental and most practical condition for commercialization. Realistically, the Study considers putting this aspect at the center especially because major changes in this aspect are taking place in the study area as a result of improved connectivity with major consumer markets.

Hence, the scenarios for commercialization are to proceed in a progressive manner from where better accessibility is achieved in the study area, through well thought-out and concerted efforts among the concerned stakeholders. The areas where the accessibility improvements will not take place before 2020 should opt for alternative approaches for commercialization considering their resource endowments, generally through forests and NTFPs.

CHAPTER 7 BASIC DEVELOPMENT STRATEGY FOR AGRICULTURAL COMMERCIALIZATION OF THE STUDY AREA

7.1 Agricultural Commercialization Under BDS

The definition of agricultural commercialization in the context of Nepal presented in Section 2.2 of Part I has been consistently followed throughout this Study, and all the analyses, activities, and planning have been based on this definition, as follows:

As stated in Section 2.2:

“Agricultural commercialization” in Nepal is a concept to be recognized not as the commercialization with high-level processing such as agricultural mechanization or mass production, but as a measure to exit from low-level subsistence agriculture.

In order to elaborate this definition, especially for the study area, a table adopted from another study is presented as Table 7.1 in the following page. The table attempts to differentiate the degrees of commercialization in accordance with different dimensions.

The shaded texts in Table 7.1 represent the general status of the study area based on the observations of the Study Team during the past two and a half years. As shown in the table, the agricultural commercialization status in the study area is low in most dimensions. Therefore, the agricultural commercialization of the study area should continuously improve, and shall consist of efforts to move from low to medium status in each of the dimensions listed in the table.

A ray of hope, however, is also shown in Table 7.1, i.e., the status of the study area in infrastructure dimension and especially in that of road infrastructure. The ripple effects expected to emerge from this dimension definitely provide the opportunities for the status of other dimensions to advance, through gradual establishment of linkages between producers and consumers in the time to come, fostered by the strategic location of the study area being in proximity to major consumer markets.

Moreover, in the aspect of regional development, the degrees of agricultural commercialization have special significance. Given that the agriculture sector is the most important sector in the economic development of the study districts with the engagement of more than 70%⁵² of the workforce in average, its advancement will stimulate the activities of other related economic sectors such as services and manufacturing. In addition, it has the potential to exert deterrence effects on the trend of the ongoing population drain in the area.

Although this prospect may seem a little far-fetched for the master plan with rather limited planning horizon until 2020, the Study believes in the potential of the area to be developed with agricultural commercialization as the leading activity.

⁵² CBS, 2002

Table 7.1: Different Degrees of Agricultural Commercialization

Dimension	Low	Medium	High	Advanced
Farmers	<ul style="list-style-type: none"> • Large number of subsistence farmers • Farming as a way of living • Mostly involved in cereals; little specialization in HVC • Few people have qualifications 	<ul style="list-style-type: none"> • Small number of subsistence farmers • Emerging professionalism of farming • Greater specialization in HVC 	<ul style="list-style-type: none"> • Professional farmers • Specialized production • Corporatization of farming 	<ul style="list-style-type: none"> • Industrialization of agriculture
Technology	<ul style="list-style-type: none"> • Rudimentary post-harvest operations • Little agro-processing • Labor intensive 	<ul style="list-style-type: none"> • Increased use of post-harvest operations • More agro-processing • Intensification and increased use of modern technology • More capital intensive 	<ul style="list-style-type: none"> • High importance of post- production activities • Highly capital intensive 	<ul style="list-style-type: none"> • Precision agriculture • Biotechnology • Organic farming • Highly capital intensive
Markets and Marketing	<ul style="list-style-type: none"> • Small marketable surplus 	<ul style="list-style-type: none"> • Larger marketable surplus • Emergence of large agricultural markets and horizontal integration 	<ul style="list-style-type: none"> • Emergence of vertical integration • Futures markets • Increasing concentration of production and marketing • Branding 	<ul style="list-style-type: none"> • Global integration of value chain • Intensification of vertical integration • High concentration in marketing and distribution
Finance	<ul style="list-style-type: none"> • Mostly cash transactions • Little private investment in agriculture 	<ul style="list-style-type: none"> • Greater use of credit • Greater investment by private sector 	<ul style="list-style-type: none"> • Variety of credit and insurance mechanisms 	<ul style="list-style-type: none"> • Futures, options, and derivative markets
Institutions	<ul style="list-style-type: none"> • Virtual absence of formalization of processes of production, marketing, processing and grading • Little information systems available to farmers and traders • Weak linkages between research and extension and farmers, marketers and entrepreneurs • Few, small and mostly ineffective farmer organizations and trade associations 	<ul style="list-style-type: none"> • Emerging formalization of production and post-production activities • Emerging formal information • Greater role of public and private research and extension to farmers, markers and entrepreneurs • Emergence of larger and more effective farmer organizations and trade • Emerging domestic standards 	<ul style="list-style-type: none"> • Agricultural information services provided by a variety of private sector firms • Highly formalized systems of production and post-production • Research and extension highly professional and funded by corporations • Strong farmer lobbies and trade associations • International quality standards 	<ul style="list-style-type: none"> • Information technology and management systems supporting agriculture • Powerful lobbying of producers and trade associations • International quality standards and certification procedures
Infra-structure	<ul style="list-style-type: none"> • Poor road infrastructure and other transportation 	<ul style="list-style-type: none"> • <u>Road infrastructure increasingly used, but still difficult to</u> 	<ul style="list-style-type: none"> • Easy access of farmers by road, water and air 	<ul style="list-style-type: none"> • Intermodal transport infrastructure (railway, truck, ship,

Dimension	Low	Medium	High	Advanced
	infrastructure <ul style="list-style-type: none"> • Few stakeholders using modern means of communication • Almost no rural electrification • Rudimentary structures of market places • Some public storage facilities but little private storage facilities • Mostly rain-fed irrigation 	access many production areas <ul style="list-style-type: none"> • Use of telephone becoming more common, particularly in trading and processing • Rural electrification in rural towns and surroundings • Concrete structure for wholesale markets and some rural markets • Few private storage facilities • Irrigation schemes and rain-fed agriculture 	<ul style="list-style-type: none"> • Telephone available to all farmers • Rural electrification available to all farmers • Silos and cold storage widely available • Year-round irrigation 	containers) <ul style="list-style-type: none"> • Internet business –to –business transactions • Full electrification and alternative use of energy • Irrigation pipeline systems and water resource management system applied • Computerized storage systems
Consumers	<ul style="list-style-type: none"> • Little awareness of quality • Virtual absence of consultation of consumers preferences 	<ul style="list-style-type: none"> • Increased awareness of consumers about quality • Consumers preferences start to be taken into account by marketers and producers 	<ul style="list-style-type: none"> • Consumer lobbying • Consumer market demand studies 	<ul style="list-style-type: none"> • Strong consumers lobbying • In-depth consumer behavior studies

Source: ANZDEC, 2003

7.2 Review of the DBDS

Based on the DBDS formulated in March 2012, a set of pilot projects has been implemented in order to examine the validities of strategies listed in DBDS. The pilot projects were small in scale but attempted to include as much aspects as possible from DBDS. Although there were a number of lessons learned after the pilot project implementation, the basic outcomes expected to emerge in the pilot projects have been achieved. It can be said that the outcome from pilot projects support the DBDS. Hence, the concepts proposed in DBDS will be basically carried over to the Basic Development Strategy (BDS) with minor revisions.

The minor revision given to DBDS in order to update it as BDS are listed as follows:

Table 7.2: Alterations made on DBDS

#	Strategies	Parts of DBDS Altered in the Process of Updating DBDS to BDS
1.	Core Strategy	<ul style="list-style-type: none"> • Reordered the strategies by listing the broader strategy first and the more specific strategy last. • Minor rewordings to specify the scopes and clarify the expressions to be more comprehensible. • Added another core strategy emphasizing on the balance and speed of commercialization, based on the lessons learned from the pilot projects.
2.	Strategy for Vegetables ⁵³	<ul style="list-style-type: none"> • Minor rewordings to specify the scopes and clarify the expressions to be more comprehensible. • Strategies 2 to 4 in DBDS touching upon marketing aspect have been

⁵³ Vegetables include some spice crops such as ginger, turmeric, onion, garlic, and chili.

		merged as Strategy 2 of BDS. Hence, the number of strategies for vegetables was reduced from five to three.
3.	Strategy for Fruits	<ul style="list-style-type: none"> Deleted a strategy concerning the outflow of population and included this element in the newly added core strategy. Merged two strategies concerning the promotion and marketing of fruits. Hence, the number of strategies for fruits was reduced from three to one.
4.	Strategy for Livestock	<ul style="list-style-type: none"> Reordered the strategies by listing the broader strategy first and the more specific strategy last, while rewording the strategy on livestock marketing.
5.	Strategy for Producer Organizations	<ul style="list-style-type: none"> No alteration.

7.3 Outline of Basic Development Strategy

The outline of BDS, the Study Team proposes for the agricultural commercialization in the study area towards 2020 is presented as follows:

7.3.1 Core Strategy

Strategy 1: Work progressively in the areas where accesses which is the prime condition for agricultural commercialization, will be improved through road network improvements, taking into consideration appropriate crops for the right lands.

Strategy 2: Promote the SRC area as a production center of HVCs especially for vegetables, fruits, and milk, in order to supply the rapidly growing food demands of the Kathmandu Valley area.

Strategy 3: Promote the production of off-season vegetables by taking advantage of agro-ecological features of the SRC area, in order to supply the demands in Kathmandu Valley as well as in the Terai plain areas.

Strategy 4: Strengthen both the “production” and “distribution” aspects of HVCs in a parallel manner, in order to carry forward agricultural commercialization. The production aspect comprises production increase, quality improvement, and supply stability. The distribution aspect comprises efficient arrangement of distribution facilities and establishment of business linkages between producers’ organizations and private sector businesses.

Strategy 5: Focus on the promotion of private sector involvements in the SRC area. This is because in the strengthening activity for both “production” and “distribution” aspects, integrated efforts, e.g., technology, facility, and organizational and institutional aspects, will be required and the involvement of private sector players is considered indispensable.

Strategy 6: Pay due attention to the vulnerability of farm economy and labor constraints, as well as the speed of commercialization, in order not to impose excessive risks to households. Balance of various income sources, e.g., agriculture and livestock as well as other incomes should be taken into account to secure the economic resilience of smallholders.

7.3.2 Sub-sector Strategies

(1) Strategy for Horticulture Commercialization (Vegetables/Fruits)

BDS HO-1: Promote the SRC area to grow as the major supply station of HVCs for Kathmandu Valley and for off-season crops to the Terai Region.

BDS HO-2: Strengthen the marketing system of HVCs through capacity development of producer groups for their improved bargaining power in relation with other market players and establish in parallel the two-way information flow between producers and consumers.

BDS HO-3: Promote the stable supply of quality produce that are marketable and profitable for market players.

BDS HO-4 : Focus only on truly marketable fruit commodities and concentrate on their (Fruits) marketing.

(2) Strategy for Livestock Commercialization (Dairy/Meat)

BDS LI-1: Put the highest priority on improvement of livestock productivity based on traditional ways of livestock rearing.

BDS LI-2: Give priority to ruminant animals over non-ruminant animals considering the feed resources in Nepal.

BDS LI-3: Give priority to milk and goat meat for livestock development.

BDS LI-4: Work through existing systems for milk and goat meat marketing.

(3) Strategy for the Producer Groups for Commercialization

BDS PG-1: Transform agricultural cooperatives/groups from welfare service organizations into profit-seeking organizations.

BDS PG-2: Guarantee stable supply to meet demand in the value chain.

BDS PG-3: Conduct a joint marketing work and build a trusting relationship with traders.

7.3.3 Relations between Core and Sub-sector Strategies

Figure 7.1 and Table 7.3 present the relations between core and sub-sector BDSs presented above.

As it can be observed in Table 7.2, the relations between core and sub-sector strategies can be described as; “sub-sector strategies that are relatively more specific in comparison to core strategies tend to converge into production – marketing domains” that require concerted efforts for agricultural commercialization.

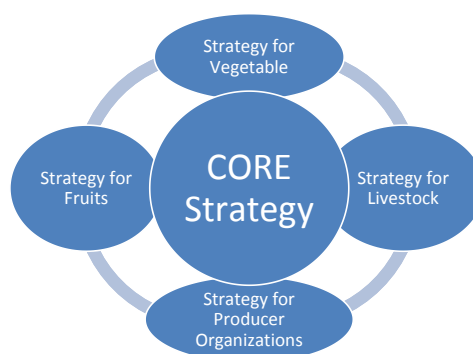


Figure 7.1: Relations between Strategies

Table 7.3: Relations between Strategies under BDS

Core Strategy (CO)	Subsector Strategies		
	Horticulture (Vegetables and Fruits)	Livestock (Dairy and Meat)	Producer Organization
CO-1: <u>Work progressively in the areas where accesses, the prime condition for agricultural commercialization, will be improved</u> through road network improvements, taking into consideration the appropriate crops for right lands.	<p>HO-1: Promote the growth of the SRC area as a major supply station of HVCs to Kathmandu Valley and for off-season crops of Terai Region.</p> <p>← (7.4.1)</p>	<p>Note: Strategies are grouped into seven sets framed in by thick lines for convenience of elaboration. The three-digit numbers in brackets () indicate the sections in this report where the description of those grouped strategies are made.</p> <p>← (7.4.2)</p>	<p>(7.4.7)</p>
<p>CO-2: Promote the SRC area as production center of HVCs especially that of vegetables, fruits, and milk, to supply the rapidly growing food demands of Kathmandu Valley area.</p> <p>CO-3: <u>Promote the production of off-season vegetables</u> by taking advantage of the agro-ecological features of a part of the SRC area, to supply the demands of Kathmandu Valley as well as that of the Terai plain areas.</p>			
<p>CO-4: Strengthen both “production” and “distribution” aspects of HVCs in a parallel manner, in order to carry forward agricultural commercialization. The production aspect comprises production increase, quality improvement, and stable supply, while distribution aspect comprises efficient arrangement of distribution facilities and establishment of business linkages between producers’ organizations and private sector businesses.</p> <p>(7.4.3)</p>	<p>HO-2: Strengthen the marketing system of HVCs through the capacity development of producer groups for their improved bargaining power in relation with other market players and in a parallel manner, establish the two-way information flow between producers and consumers.</p>	<p>LI-2: Give priority to ruminant animals over non-ruminant animals considering the available feed resources in Nepal.</p> <p>LI-3: Give priority to milk and goat meat for livestock development.</p> <p>(7.4.6)</p>	<p>PG-1: Transform agricultural cooperatives/groups from welfare service-type organization into profit-seeking organization.</p>
<p>CO-5: <u>Focus on the promotion of private sector involvements</u> in the SRC area. This is because in the activity strengthening of both “production” and “distribution” aspects, integrated efforts, e.g., technology, facility, organizational, and institutional, will be required and the involvement of the private sector players is considered indispensable.</p>	<p>HO-3: Promote the stable supply of quality produce which is marketable and profitable for market players.</p> <p>HO-4 (fruits): Focus only on truly marketable fruit commodities and concentrate on their marketing.</p>	<p>LI-4: Work through the existing systems for milk and goat meat marketing.</p>	<p>PG-2: Guarantee stable supply to meet the demand in value chain.</p> <p>PG-3: Conduct a joint work on marketing and build a relationship of trust with traders.</p>
<p>CO-6: <u>Pay due attention on the vulnerability of farm economy and labor constraints, as well as the speed of commercialization, in order not to impose excessive risks to the households.</u> Balance of various income sources, e.g., agriculture and livestock as well as other incomes should be taken into account to undergird the economic resilience of smallholders.</p>	<p>← (7.4.5)</p> <p>(7.4.4)</p>	<p>LI-1: Put highest priority on the improvement of livestock productivity based on traditional methods of livestock rearing.</p>	

Source: Study Team

In the following section, the description of BDS will be presented in parts and in accordance with the grouping shown in Table 7.3. The grouping was made based on the similarities and relevance among the strategies, with the purpose of avoiding duplication as well as redundancy.

7.4 Descriptions of BDS⁵⁴

7.4.1 [CO-1]: Work Progressively in the Areas Where the Accesses will be Improved

In a general sense, agricultural commercialization requires accessibility improvement as one of its fundamental conditions. In other words, agricultural commercialization will not take place without accessibility. As for the study area lying in the eastern proximity of the growing national capital with progressively-improving connectivity, favorable opportunity is also progressively opening for commercialization. Hence, well thought-out interventions to seize this opening opportunity are desired.

7.4.2 [CO-2, CO-3, and HO-1]: Promote the Study Area as a Major Production Center of HVCs to Kathmandu Valley and for Off-season Crops of Terai Plain

(1) Supply for Rapidly Growing Population in Kathmandu Valley

The population statistics⁵⁵ indicate that the population of Metropolitan Kathmandu is growing very fast with an annual rate of 4.76% (2001-2011). Accordingly, the volume of vegetables handled by Kalimati Wholesale Market is increasing with the rate of 8.6% per annum (2005-2012). These two figures also suggest that changes in the diet of consumers may have been taking place.

The vegetable supply for Kathmandu area is now largely supported by the suburban agriculture in Bhaktapur and Lalitpur. However, those two major supply areas are gradually shifting to the urban area in order to absorb the growing population of Kathmandu Valley and as a result, the farm lands in those areas are diminishing. In parallel, the area connected with the road networks of Kathmandu Valley, e.g., Nuwakot, Dadhing, Makwanpur, and Kavre, which is a part of the study area, have been growing as a production area of vegetables to supply the capital.

After the completion of the Sindhuli Road, access to the Kathmandu Valley from the study area will be significantly improved. Hence, the study area has an advantage to become a vegetable supply station for Kathmandu Valley in the near future.

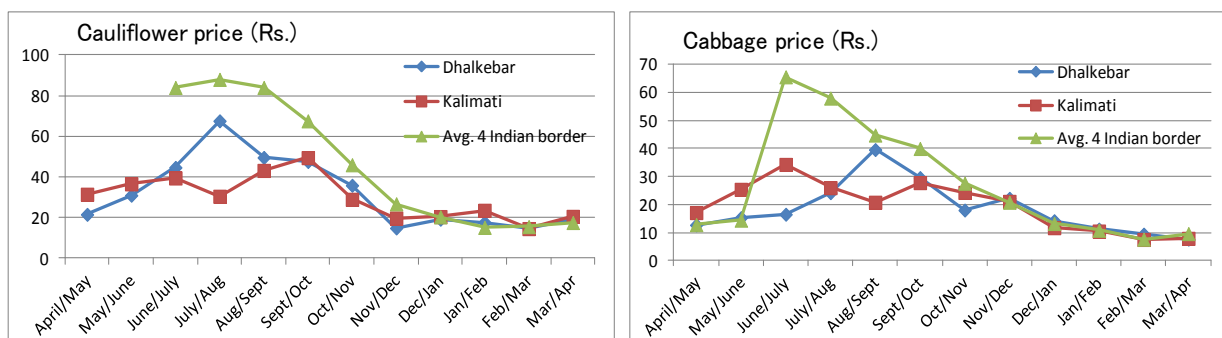
The pilot projects that were implemented to demonstrate the appropriate effects of properly applied input materials have proven that it could increase the production more than five-folds compared to the traditional practice, and it clearly expressed the cost efficiency of input materials even under the regular market prices that farmers can purchase. The improved productivity demonstrated under the pilot projects helps create a competitive status for the study area to grow as one of the major suppliers of vegetables in the Kathmandu Market.

⁵⁴ Although the descriptions in this section partially be the recapitulation of that of DBDS, it was allowed in order to present the overall picture of the BDS which is the updated version from DBDS.

⁵⁵ Nepal Census 2011

(2) Comparative Advantage of the Study Area to Supply Off-season Crops

Since the study area encompasses the various agro-ecological regions, there is a potential to produce and supply off-season products for better prices. In order to verify this, the Study conducted a short research to find out the price fluctuations of major vegetables in the four vegetable wholesale markets located in the Indian side close to the national border.⁵⁶ The result of this short research supported that in the Terai plain there are high demands for off-season crops that can be produced in temperate zones in the study area, e.g., cauliflower and cabbage during summer season (June-October). Figure 7.2 illustrates the price fluctuations of cauliflower and cabbage in Kalimati Market in Kathmandu, Dhalkebar Market in the Terai area of Nepal, and the average of four markets (Jayanagar, Madhubani, Sursand, and Sitamarhi) that are close to the national border in the Indian side.



Source: Study Team

Figure 7.2: Price Fluctuations of Cauliflower and Cabbage in Kalimati, Dhalkebar and 4 Border Markets in Indian Side

Although it will require some time to see the formal exportation process to be more efficient, the potential of the study area to supply off-season vegetables to the Terai lowlands and beyond the border should be foreseen. With the improvement of the transportability of vegetables from Dolakha and Ramechhap areas towards south after the completion of the bridge at Kurkhot, the competitiveness of the study area for supplying off-season vegetables to Terai is expected to increase.

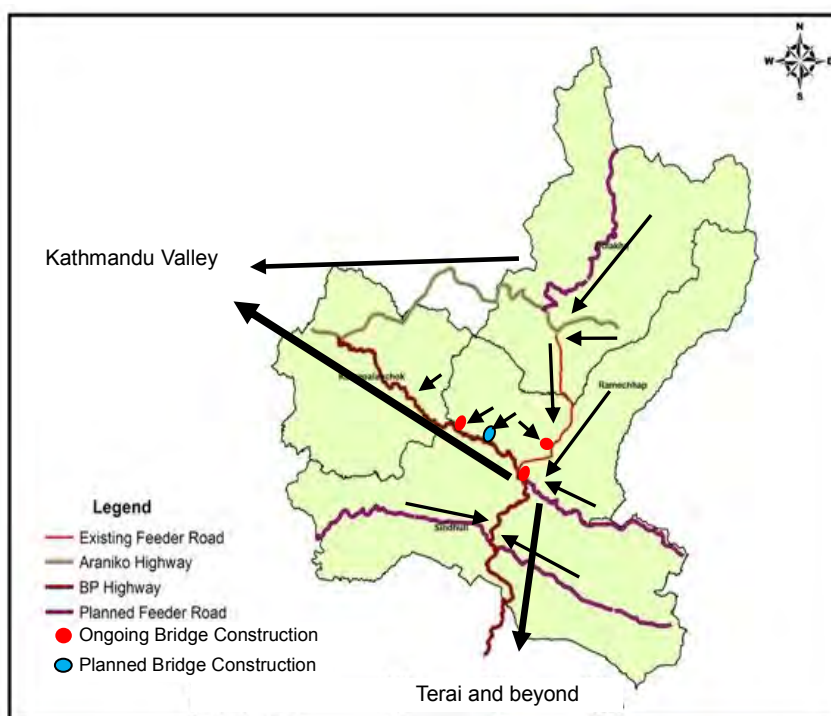


Figure 7.3: Potential Future Flows of HVCs to Major Markets

⁵⁶ The report is included in SN 6 of Volume II.

(3) Competitiveness Against Imports

The competitiveness against imported vegetables needs to be considered especially those from India, since almost one-fourth of the vegetables handled in Kalimati Market are imported from India.⁵⁷ However, the imported vegetables from India mainly consist of potatoes and onions (e.g., 81% of the total volume of imported vegetables from India in 2011) that are hard and storable commodities, while soft and perishable vegetables are still mostly domestically supplied. This proves that at present the domestic production of soft and perishable vegetables have comparative advantage over imported ones. Although there exists the possibilities that soft and perishable Indian vegetables will also enter Nepal's domestic market in the future, it is unlikely considered to happen so soon. In order for the vegetables produced in the study area to be competitive against Indian imports, the vegetable value chain of the study area especially that of lowland vegetables need to be efficient enough, before the Indian imports try to enter Nepal's market in a larger scale.

7.4.3 [CO-4, CO-5, HO-2, and HO-3]: Strategies Emphasizing the Strengthening of the Vegetable Value Chain from Production to Marketing Aspects

(1) Importance to Focus on Value Chain

The approach of the development strategy for vegetables is not only for production but also for the efficiency improvement of the market system. Based on the value chain analyses conducted under the Study, it was found that the majority of shipments went into intermediary market chain where the transactions are handled by traders and wholesalers, because producers have very limited ability to handle the commodities by themselves. Consequently, they rely on traders and collectors for marketing. Producers are the professional growers but not the traders, and trading is fundamentally different from production. In order for producers to be able to concentrate on farming/producing, the marketing aspect should be dealt with by other players, including the government for its regulatory functions and traders for marketing. Hence, the basic strategy for agricultural commercialization focuses on the improvement of the marketing system by efficiently outsourcing the task to intermediaries and secure markets for producers. In other words, looking into the entire value chain and its players is indispensably important for agricultural commercialization.

(2) Private Sector Involvement in Inputs Supply and Extension

Given that the farmers in the study area are not used to the application of agricultural inputs to crops, there are no adequate distribution systems within the area. Agro-vets will be the expected suppliers, although the current level of their knowledge is not adequate to satisfy farmers' demands and to advice on the actual usage of the products they supply. Also, the existing government extension system is judged inadequate to meet the requirements due to its limitation in capacity.

Expansion of input demands through promotion of profitable vegetable production may cover the extension cost by local agro-vets to disseminate appropriate input application techniques in their

⁵⁷ In contrast, imported vegetables from China (Tibet) represent only approximately 1% of the vegetables handled in Kalimati and of that, almost all are onions.

business practice. For this to function, several agro-vets should be fostered for each kind of inputs such as fertilizers and pesticides. Hence, initial training activities should be arranged, in order to start up the private business type extension system in a manner that is complementary to the existing public extension system.

(3) Strengthen the Function of Producers' Organizations to Perform as Service Provider for Market Players

One of the major purposes of agricultural cooperative is to aggregate the uniform commodity in a certain volume to improve efficiency in shipping and marketing. In the current marketing system, in order to meet consumers demand for the timely supply of produce both in quantity and quality, traders aggregate each individual farmer's commodity by themselves. Although in the future, cooperatives may potentially take over the said traders' role, it is not likely that producers will become capable of performing such kind of task by year 2020. Hence, the strategy aims to improve the existing marketing system through better coordination between intermediary market players and producers.

On that account, the government should at least guide farmers to initiate the effort in establishing a cooperative to perform as "one-stop-window" for all traders. The government is also expected to assist individual traders to become more effective and efficient, e.g., local traders also need to form a group to have more negotiating power with central traders/wholesalers as well as with cooperatives. While the cooperatives concentrate on producing, traders must carry out the duty of negotiating better price with the downstream players. Also, traders must carry out the duty of transmitting information concerning consumer preferences and any other useful information for producers to increase their benefits.

Although the main task of the farmer group is to develop a good relationship with their clients such as traders as market players, farmers tend to deny traders by claiming that they are taking too much profit. However, it was confirmed in the Study that under the current system, there is very limited room for traders to give higher prices while farmers have larger room to increase profit through improved production. Hence, the farmer groups should endeavor in producing better crops in aggregate in order to provide more favorable marketing opportunities to their clients, i.e., traders, than effortless competition with them in the marketing task.

Appropriate marketing practices developed through the pilot projects improved the negotiating capacity of the farmer groups as they successfully sold off their production without any conflict. Friendly business relationships developed during the pilot projects consequently regenerated the following transactions between farmer groups and traders. For the efficient profit seeking, the Study recommends for the farmer groups to cooperate, rather than compete, as service provider for other market players.

(4) Promotion of Stable Supply of Quality Produce

In order to become an attractive production area, stable supply of quality produce for traders must be ensured so they will continuously comeback. As it is impossible for single producers to attain the aforesaid stability, a group must be formed to produce the same commodity of identical standards and

methods. Producers must understand that stable and efficient production is possible only with constant inventory supported by uniform group production.

In the quality aspect, mutual trust between market players and producers should be developed. Currently, producers and traders must agree in every transaction after inspection of the commodity. This inspection process causes a lot of unnecessary cost and labor. The government is expected to promote the introduction of uniform standards for grading to avoid unnecessary inspection works. For that to proceed, mutual understanding must be initially developed and should start by convincing producers on its benefits such as reduction of shipping wastes, reduced cost for shipment, or lesser cost for inspection which lead to higher prices of produce. These activities combined together will facilitate producers to have a better understanding of consumer demands as well as the necessity to apply certain farming methods to produce a marketable commodity.

(5) Importance of Physical Measures to Support Stable Supply of Production

1) Irrigation:

In order to help ensure stable and reliable quantity of product supply, some physical measures such as various forms of irrigation systems with technical advice should also be taken. For example, production of dry season vegetable has economic efficiency if appropriate irrigation is available. The reason why the MWUS, which is the non-conventional type irrigation system, was introduced in Bocha pilot site was because gravity-fed water supply is considered cost efficient. The MWUS in Bocha has expanded the dry season vegetable production at reasonable size compared to the investment cost. Considering the profitability of vegetable production achievable with appropriate inputs, not only the gravity-type system but also the pump irrigation system in suitable location such as river bank pockets, may be feasible in expanding the production capacity. Potential areas for dry-season vegetables will largely increase if pump irrigation is introduced, therefore, the option to introduce pump irrigation should also be considered.

2) Market-related Facilities in Strategic Location:

In order to help in the improvement of the marketing system, some physical measures should also be taken. For example, in order to improve the physical linkage between the production and consumption areas, provisions of hierarchical networks of collection points and central collection centers in a number of strategic locations in the study area is considered important. Moreover, it is worth to consider the provision of regional-level collection centers in strategic locations. For example, construction of a multi-functional collection center in Kurkhot, where the Sindhuli Road and north-south feeder road from Ramechhap across the Sunkoshi River will be connected in the near future, would be a good potential to set up a large-sized collection center for all HVCs, equipped with cold storage facility, technical information services such as ASCs and agro-vets shops. Given its strategic location, it can function as an important regional service hub for both logistics and information aspects for multiple directions.

7.4.4 [HO-4 (Fruits)]: Focus Only on Truly Marketable Fruit Commodities and Concentrate on its Marketing

(1) Potential Market in Fruit Demand

Junar has an established market within the country. On the other hand, the markets of other fruits are already occupied by imports, mainly from India and China. The qualities of these imported produce are relatively high compared to domestic equivalent fruits. Given that the introduction of a new crop variety with adequate competitiveness to the area would require long-term commitment, it is recommended to concentrate on Junar production and marketing for the time being, in order to accumulate more competitive knowledge before taking different challenges. Promotion of the emerging and potential commodities should be planned with due consideration on their future marketability coupled with certain marketing strategies.

(2) Marketing of Junar

Currently, marketing of fruits, especially Junar, is still mainly dependent on local traders. Many cooperatives under the Junar Central Cooperative Union have a system that guarantees the sale of the harvest. The cooperative buys Junar from producers and they shoulder the risk of selling it. However, many producers often sell Junar to local traders their entire tree of produce even before they have fully ripened. By doing so, producers can shift the labor intensive and hardest harvesting work in the orchard to traders; however, it results in lower unit price. While the harvesting workers hired by traders often damage the trees and adversely affect the following year's production, it was observed that selling the fruits before its ripening stage has prevented biannual bearing which is appreciated by farmers. This outsourcing practice needs to be addressed in order to promote the marketing of Junar probably through the efforts of the union.

(3) Maintenance of Junar Production

As for Junar, the farmers that participated in the pilot project had improved their production techniques to produce higher quality fruits, although they need to be a lot more effective to compete against imports. Thinning and pruning techniques were introduced in the pilot project but the farmers are still hesitant to thin out good fruits.

There is an emerging challenge for Junar production like disease control, which posed as a critical problem. The citrus greening disease has been spreading in Nepal and has damaged the Suntara orange production areas in other regions. Therefore, maintenance of the current production of Junar by protecting them from the disease should be urgently sought for.

7.4.5 [CO-6, LI-1]: Strategies Calling for Attentions on the Vulnerability Aspect of Farm Economy

It is quite important to look into the resilience of farm economy when promoting agricultural commercialization. For smallholders to endeavor into vegetable production which is destined with a certain level of unavoidable market risks, some kind of risk hedge should be combined. In light of this, it is considered important to maintain the balance between the challenging portion (i.e., vegetable

production for commercialization) and traditional portion (i.e., self-sufficient agriculture with traditional livestock rearing as income source as well as assets for emergency) of farming. Taking into consideration the labor constraint is also indispensable, because population drain especially of young males is continuously happening in the rural areas of Nepal and the study area is not an exception.

With the appropriate risk hedging ensured, the smallholders can gradually shift from traditional farming into commercial farming, and the interventions to promote commercialization should be heedful for this aspect.

7.4.6 [LI-2, LI-3, LI-4]: Strategies for Livestock Subsector

(1) Give Priority to Ruminant Animals Considering the Feed Resources in Nepal

Given the availability of feed resources in Nepal, ruminant animals have been given priority over non-ruminant animals. Although the area and volume of cereal cultivation and production have somehow increased in the last 13 years, feed resource balance has not improved due to the increase in human and livestock population. Most of the feeds for non-ruminant animals, such as pigs and poultry, need to be imported into Nepal, and commercialized poultry and swine farming have been contributing to the problem of increased imports of agricultural products in recent years. High-density and large-scale poultry farming face a big risk in terms of hygiene, especially in preventing bird flu. In case of large-scale swine farming, a high level of technical skill related to feeding and reproduction management is necessary. Additionally, as the demand for pork is limited due to religious reasons, there is little chance that the demand will increase.

(2) Give Priority to Milk and Goat Meat for Livestock Development

Buffaloes, cattle, and goats are reared by almost all farmers in the study area which are the reasonable targets for commercialization when considering the current situation. From the above discussion, the basic strategy for livestock sector until 2020 should focus on the improvement of dairy and goat meat productivities.

1) Increase Milk Yields:

The most important issues to be addressed in order to improve milk production are the improvements in feed management techniques, genetic capacity of livestock, and countermeasures to prevent or mitigate livestock diseases. If these issues are tackled in an integrated way, the milk production capacity is expected to be improved. Given that improvement and prevention are mutually related, it is desirable to promote them in a parallel manner.

In the pilot activities of the Study, positive results were attained from improved feeding management techniques for milk yield, therefore, further continuation and dissemination of this activity is desired.

2) Development of Reproduction and Fattening Techniques:

About 90% of the goats in the livestock markets in Kathmandu are imported from India. If the increase of domestic goat production gains its market share, it needs to produce good or better goats than that of the imports. In order to achieve this goal in the study area, reproduction and fattening techniques need to be developed for breeds having environment adaptability and marketability. In particular,

activities for improvement of weight gain, increase of herd size, and improvement of rearing environment are important.

In the pilot activities of the Study, positive results were attained from improved feeding management techniques for the goats to gain weight. Further continuation and dissemination of this activity is desired.

(3) Work through Existing Systems for Milk and Goat Marketing

The existing marketing system of milk and goat in the study area is considered well functioning. The milk collection network is progressively extending its outreach along the corridor in a competitive manner between collectors. Goats are collected by local traders in the way suitable for the production pace of the goats in the area and shipped accordingly. Hence, the strategy for milk and goat marketing is to work through the existing systems.

7.4.7 [PG-1, PG-2, PG-3]: Strategies for Producer Organization

(1) Transform Agricultural Cooperatives/Groups from Welfare Service-Type Organization into Profit-seeking Organization

The Producers' groups shall be one of the players in the agriculture/livestock business value chain. Having a business in mind, seeking profits as a group creates sustainability of their production activities. Once a successful group is recognized, other groups shall be encouraged and transformed into business-oriented organization, as a chain reaction.

Under the pilot activity of the Study, farmer groups were requested to operate the collection center as a marketing agency. Existing local traders were appointed to take care of daily management duties such as marketing, handling of commodities, and accounting. Requested duties were specific enough and also appropriately appointed to be performed. The general practices of local traders were normally and smoothly transferred to the new management group. Transformation of the group from merely a welfare function into a profit-seeking business needs to start from accepting the appropriate profit share of other members according to the roles they have performed.

(2) Guarantee Stable Supply to Meet the Demand in Value Chain

From the aspect of production, the producers groups shall secure stable supply with a certain level of quality. In order to increase productivity and quality levels, investment in agro-inputs, facilities, and technologies are highly required. Being a profit-seeking group enables the producer group to invest in the aforementioned items to upgrade their production.

Aggregation of produce is a major negotiating tool for advantageous marketing. Although the stable supply was not yet attained under the pilot project since its size was not big enough, it was proven that 10 to 15 farmers were more competitive than a single farmer and they have experienced a significant level of advantage in group marketing. One of the clients in Kathmandu offered a new transaction for aggregate production to the pilot group and it was the result of their efforts to attain stable supply. For the said group, membership has tripled to meet the market demand with stability. The reputations of such group will definitely attract more clients, once they have fulfilled their duties. Such a move will

facilitate the group to transform further into a business-oriented and profit-seeking organization.

(3) Conduct a Joint Work on Marketing and Build a Relationship of Trust with Traders

It is critical for the producer groups to jointly involve in marketing activities, establishing networks with the private sector and reliable traders. Building trust in a relationship between the producer groups and traders will motivate producers to concentrate on production and reduce unnecessary costs or labor, such as carrying their products to the market by themselves.

In relation to this, within the producer group, it is also necessary to entrust the marketing duty to a representing member to perform the role of a contact window for all members and with central traders, in order to be efficient in marketing. The marketing task will not directly increase as the handling volume of produce increases; therefore, one representing member may be able to handle the whole group production. The efficiency of marketing certainly has benefits to the group members. Reduced marketing work for each farmer can be redirected to production work. During the pilot project, the pilot farmers expressed that this benefit is sufficient enough to pay the collection center fee.

7.5 Roles Divisions between Public, Private, and Community Sectors for Agricultural Commercialization

One of the keystones of BDS described above relates to the roles that need to be performed by different actors in agricultural commercialization. Figure 7.3.1 presents the activity domains for different actors which are expected to perform. The BDS and various policies as well as other activities that pursue agricultural commercialization in Nepal emphasized the strengthening of the activities in domain “D” in the said figure. The reason for that is, as a matter of course, the paramount importance to foster the strong producers-consumers linkage for commercialization. Likewise, in BDS, an emphasis was on establishing the linkage in domain “D”, while at the same time the producers and business players concentrate on improving efficiencies in their respective roles.

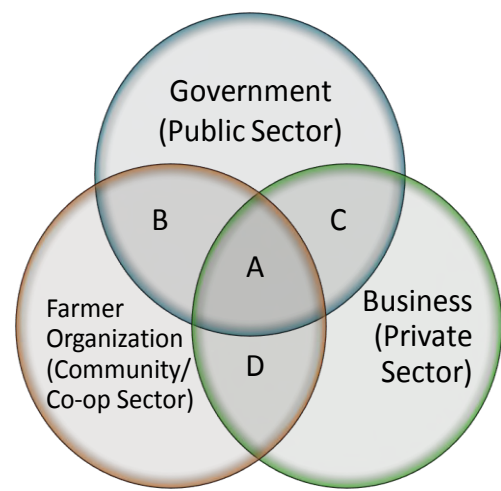


Figure 7.4: Activity Domains for Different Actors for Agricultural Commercialization

As for the public sector, the role that it is expected to be performed in the context of agricultural commercialization is multifold. In domain “B”, the public sector is expected to deliver the services that private sector players are unable to provide to producers, whereas in domain “C”, it is expected to foster the level playing fields for the private sector players to compete equitably, by performing the regulator-supervisor roles with authority. Moreover, in domain “A,” the public sector players are expected to step into performing rather uncharted roles as a bonding agent between producers and business players through provisions of information, opportunities, technology, and incentives in various forms and ways. At this juncture, the public sector players are also expected to play their role

in a significant manner as indispensable backseat players who support the main players of agricultural commercialization which are the producers and business sector players.

CHAPTER 8 POLICY MATRIX, PROJECT LONG LIST AND STRATEGIC PROGRAMMING

8.1 Policy Matrix for the Agricultural Commercialization in the Study Area

Table 8.1 presented the policy matrix developed based on the development scenarios resulting from zoning as well as from BDS. The purpose of the policy matrix is to indicate the priority policies that GON has suggested to adopt for agricultural commercialization of the study area before 2020 and beyond.

The structure of the Policy Matrix is designed to maintain the consistency throughout higher level policy to concrete actions. Hence, the far left column includes excerpts from the Policy Option Paper of the ADS⁵⁸ relating to the commercialization of agriculture. By moving towards the right from the farthest left column of the Policy Matrix, the contents gradually change from broader policies to concrete actions that are suggested in the Study. The farthest right column includes information about the ongoing and proposed projects of the Study (this will be discussed in the project long list section).

⁵⁸ Although ADS was scheduled to be finalized in April 2013, its finalization is still under scrutiny of GON at the time of writing this report. Under such situation, the Study Team decided to include information in the Policy Option Paper of ADS (February 2013), with the presumption that the main direction proposed in the Policy Option Paper will not be changed, because it has been going through repeated consultations with various stakeholders including GON.

Table 8.1: Policy Matrix for the Agricultural Commercialization in the Study Area

Long-term National Level Policies for Agricultural Commercialization (excerpts from ADS considered applicable for the SRC area)	Proposed Goals to be Achieved by 2020 for Agricultural Commercialization of the SRC area	Proposed Policies to be Adopted for Agricultural Commercialization of the SRC area	Proposed Actions (2014 - 2020)	Implementing Agency/Organization	Proposed Projects (Ongoing Projects or in the Pipeline)
EXTENSION					
Promote participation of the private sector, NGOs, and public sector in agricultural extension and adopt a pro-poor decentralized extension system approach.	In addition to the public extension system, participation of the private sector players and NGOs should be realized, and the functional extension system geared for agricultural commercialization should be established.	Strengthen the existing public extension system to promote the function of agricultural commercialization including facilitation of the private sector players and NGOs to enter into extension activities.	<ol style="list-style-type: none"> 1. Appropriate budget allocation to enable the existing public extension system to properly function. 2. Conduct trainings (including on-the-job training) for public extension staff for the promotion of agricultural commercialization. 3. Facilitate private sector players (particularly agro-vets and traders) and NGOs to enter into extension activities and provide them necessary supports. 	CRAD CRDLS DADO DLSO Private sector Producers' cooperative, etc.	HO-1 LI-1 GO-1 GO-2 (DN-1) (DN-4) (DN-7) (DN-9) (DN-10) (DN-11) (DN-12)
RESEARCH					
The basic research, long-term strategic research, applied research and adoptive research will be the responsibility of the National Research Institutes (NRIS) and agro-ecologically based Regional Agricultural Research Stations (RARS). Collaborative and action	There are no agriculture or livestock centers with research functions existing in the study area. Hence, the outcome of research activities elsewhere should be duly transferred to the centers with extension functions in the study area.	Promote the timely and effective transfer of the research outcomes generated by the research institutes outside of the study area to the agriculture and livestock centers with extension functions in the study area.	Strengthen the existing extension functions (including the seed/sapling propagation of potential crops and breed improvement of livestock) in Boanch Horticulture Center and Jiri Livestock Farm, in order to prepare for the technology transfer from research centers.	CRAD CRDLS DADO DLSO Horticulture and Livestock Centers (i.e., Boanch and Jiri) Producers' cooperative, etc.	HO-2 GO-3

Long-term National Level Policies for Agricultural Commercialization (excerpts from ADS considered applicable for the SRC area)	Proposed Goals to be Achieved by 2020 for Agricultural Commercialization of the SRC area	Proposed Policies to be Adopted for Agricultural Commercialization of the SRC area	Proposed Actions (2014 - 2020)	Implementing Agency/Organization	Proposed Projects (Ongoing Projects or in the Pipeline)
research will be the responsibility of local research centers.					
IRRIGATION					
Expand irrigable area through the most economic and equitable means while increasing irrigation efficiency and intensity, and improve irrigation management. Develop non-conventional irrigation (NCI) and introduce efficient water application systems.	As a result of the promotion of non-conventional irrigation, e.g., MWUS and micro irrigation system (MIS), irrigable areas during dry season have expanded in the middle hill areas.	Promote the introduction of non-conventional irrigation system.	<ol style="list-style-type: none"> 1. For the MWUS type irrigation facility which utilizes the perennial mountain stream, verify the feasibility with cost and benefits prior to site selection. It is advisable to combine other activities that promote commercialization, e.g., formulation of the user group, horticulture production, and linking pockets with market. 2. For the MIS type irrigation, it is proposed to provide modest incentives together with simple guidance on its usage. 	DOI CRAD DADO Private sector Producers' cooperative, etc.	HO-3 (DN-2) (DN-5)
AGRICULTURAL INPUTS					
General:					
Ensure good quality and timely inputs are accessible to everybody particularly to the less favored groups.	A reliable supply system of the agricultural inputs has been established through which various inputs with good quality and required quantity can	Promote the conducive business environment for the input suppliers to sell agricultural inputs in the middle hill areas through strengthening of linkages	Activation and facilitation of the stable business relations between agricultural input suppliers and users, e.g., through prior arrangement of bulk purchase.	CRAD DADO Private sector (agro-vets, farm households, etc.) Producers'	HO-1 (DN-1) (DN-4) (DN-7) (DN-9)

Long-term National Level Policies for Agricultural Commercialization (excerpts from ADS considered applicable for the SRC area)	Proposed Goals to be Achieved by 2020 for Agricultural Commercialization of the SRC area	Proposed Policies to be Adopted for Agricultural Commercialization of the SRC area	Proposed Actions (2014 - 2020)	Implementing Agency/Organization	Proposed Projects (Ongoing Projects or in the Pipeline)
	be supplied on time.	between suppliers and users.		cooperative, etc.	(DN-11) (DN-12)
Seeds:					
Support the private sector and community-based seed production. Enforce quality assurance systems.	Production of seeds and saplings suitable for commercial agriculture has been increased by the initiative of private sector players such as private firms and seed farmers.	Promote private sector players in the production of high quality seeds and saplings.	In order to meet the increasing demand for high quality seeds, facilitate private sector players such as seeds/saplings producers and farmers for quality seeds/saplings production through the combination of subsidies, technical advises, and bulk supply/purchase contracts.	CRAD DADO Private sector (agro-vets, farm households, etc.) Producers' cooperative, etc.	HO-1 HO-2 (DN-1) (DN-4) (DN-8)
Fertilizer:					
Maintain fertilizer and other subsidies at 2011 level in the short term, review them in the medium term, and consider their removal in the long term. Initiate a number of measures to improve productivity and efficient fertilizer use. Enforce quality assurance systems.	The supply system of fertilizers through which the timely supply of quality fertilizer in required quantity is established. Farmers have appropriate knowledge on fertilizer and agro-chemical use. Organic fertilizers and composts production as well as their supplementary application for commercial production are promoted.	Promote the establishment of a functioning fertilizer supply system through which timely supply of the fertilizers in appropriate quality and required quantity will be achieved. Extension activities to promote the appropriate usage of fertilizers and agro-chemicals shall be strengthened. Promote the production and application of organic fertilizers and composts in order to supplement commercial	<ol style="list-style-type: none"> 1. In order to meet the increasing demand for fertilizers under commercialization, ensure substantial volume of fertilizer supply through public routes and sell them to producer groups that conduct commercial production of vegetables by priority. 2. In cases when the fertilizer supply through public routes is judged insufficient, opt for the advance bulk purchase/supply arrangement between suppliers and producers. 3. Strengthen the public extension system as well as the technical advises by the private sector players such as 	CRAD DADO Private sector (agro-vets, farm households, etc.) Producers' cooperative, etc.	HO-1 HO-2 (DN-1) (DN-4) (DN-8) (DN-9) (DN-11) (DN-12)

Long-term National Level Policies for Agricultural Commercialization (excerpts from ADS considered applicable for the SRC area)	Proposed Goals to be Achieved by 2020 for Agricultural Commercialization of the SRC area	Proposed Policies to be Adopted for Agricultural Commercialization of the SRC area	Proposed Actions (2014 - 2020)	Implementing Agency/Organization	Proposed Projects (Ongoing Projects or in the Pipeline)
		production.	agro-vets, on the proper usage of fertilizers and agro-chemicals. Conduct trainings to extension workers and private suppliers when deemed necessary. 4. Strengthen the technical extension activities for the production and application of organic fertilizers and composts.		
Animal breeds:					
Ensure that improved breeds appropriate for the Nepal farming systems conditions are available for farmers.	Diffusion of the improved animal breeds (particularly water buffalo, cow, and goat) is under progress, accompanied with the improved breeding system.	Promote the set of activities that ensure improvement of assured and steady animal breeds in the area.	1. Conduct the genetic and breed improvement of dairy animals. 2. Conduct the genetic and breed improvement of goats.	CRDLS DLSO Agro-vets Producers' cooperative, etc.	LI-2 LI-3 LI-4 GO-2 GO-3
FORESTRY					
Develop subsistence production based forestry into a competitive, agriculture friendly, and inclusive forest management practices. Improve the value chain of forestry products (timber and non-timber).	Subsistence agriculture practice in the non-accessible area is sustained while goat rearing is strengthened where forest resource is abundant. Commercial productions of some NTFPs have started.	In the non-accessible areas, support the continuation of subsistence style agriculture while promoting goat rearing where forest resources are abundant through community forestry arrangement. Promote commercial production of NTFP wherever determined	1. Strengthen goat production through community forestry-type arrangements. 2. Conduct the study of NTFPs in the SRC area, in order to verify the resource endowments, commercialization potentials, and feasibilities. When judged feasible, provide action plans to promote the value chains of selected NTFPs and	CRDLS DLSO MOFSC	HO-6 (DN-6)

Long-term National Level Policies for Agricultural Commercialization (excerpts from ADS considered applicable for the SRC area)	Proposed Goals to be Achieved by 2020 for Agricultural Commercialization of the SRC area	Proposed Policies to be Adopted for Agricultural Commercialization of the SRC area	Proposed Actions (2014 - 2020)	Implementing Agency/Organization	Proposed Projects (Ongoing Projects or in the Pipeline)
		appropriate.	implement them.		
COMMERCIALIZATION					
General:					
Transform the agriculture sector from subsistence farming into commercial purpose (i.e., it provides profitable opportunities for all stakeholders who are engage in it)	Through the progressive promotion of commercial agriculture along the roads with improved accessibility, the substantial trend and momentum of agricultural commercialization have been established in the SRC area.	Progressively promote agricultural commercialization activities in areas where accessibility has been improved, together with strategic consideration.	Select pockets endowed with higher reliability of access, production potential, and with strategic location to be developed as a production center. Through the establishment of the platform within which the main stakeholders of the value chains will participate, progressively promote agricultural commercialization in both production and marketing aspects, along the road networks where accessibility is improved.	CRAD DADO CRDLS DLSO Private sector Financial institutions Producers' cooperative, etc.	HO-1 LI-1 (DN-1) (DN-4) (DN-7) (DN-12) (GO-4)
Contractual arrangements and insurance:					
Strengthen contractual arrangements mechanism to promote agricultural commercialization.	Contractual arrangements have been introduced and expanded in the SRC area.	Promote the contractual arrangement as a type of commercial arrangement.	Promote the contractual arrangement of agricultural production and marketing, through establishment and utilization of the multi-stakeholder platform within which the main players of the value chains participate.	CRAD DADO CRDLS DLSO Private sector Financial institutions Producers' cooperative, etc.	HO-1 HO-2 LI-1 (DN-1) (DN-4) (DN-7) (GO-4)
Finance:					
Promote the development	The outreach and services	Promote improvement of the	Promote the outreach and access	CRAD	HO-1

Long-term National Level Policies for Agricultural Commercialization (excerpts from ADS considered applicable for the SRC area)	Proposed Goals to be Achieved by 2020 for Agricultural Commercialization of the SRC area	Proposed Policies to be Adopted for Agricultural Commercialization of the SRC area	Proposed Actions (2014 - 2020)	Implementing Agency/Organization	Proposed Projects (Ongoing Projects or in the Pipeline)
of diverse agricultural finance providers that supply a variety of competitive and demand-driven financial products.	of agricultural financial institutions that contribute to the agricultural commercialization of the area have been improved and responded to the financial demands.	outreach of the agricultural financial services to the areas where commercialization activities will be conducted. Promote the self-financing activities of the cooperative members in a parallel manner.	improvement of the agricultural financial services, through establishment and utilization of the multi-stakeholder platform within which the main players of the value chains, including financial institutions and producers' organizations participate.	DADO CRDLS DLSO Private sector Financial institutions Producers' cooperative, etc.	LI-1
Value chain development:					
Prioritize the development of competitive agricultural value chains that increase value added and benefits to smallholder farmers. Priority will be given to a very limited number of value chains (e.g., 5 including dairy and vegetables).	The efficient value chains (particularly of horticulture products, milk, and goats) have been established and functioning for the commercial agriculture of the area.	Focus on the development and strengthening of the horticulture, milk, and goat value chains with high efficiency and economy of scale, so as to improve the competitiveness of the area as a whole.	Establish the multi-stakeholder platform within which the main players of the value chains participate, discuss, and agree on the roles and responsibilities for strengthening value chains.	CRAD DADO CRDLS DLSO Private sector Financial institutions Producers' cooperative, etc.	HO-1 HO-2 LI-1 (DN-1) (DN-4) (DN-7) (DN-12) (GO-4)
Roads:					
Accelerate the expansion of the agricultural roads network in coordination with the ongoing rural roads programs under	The road networks within the SRC area has improved as planned by relevant authorities.	Ensure the proper implementation of the road construction and their maintenance according to the plans.	Implement road construction activities according to the plans, with the establishment of appropriate road maintenance arrangements.	DOR DOLIDAR	(DN-3) (GO-6)

Long-term National Level Policies for Agricultural Commercialization (excerpts from ADS considered applicable for the SRC area)	Proposed Goals to be Achieved by 2020 for Agricultural Commercialization of the SRC area	Proposed Policies to be Adopted for Agricultural Commercialization of the SRC area	Proposed Actions (2014 - 2020)	Implementing Agency/Organization	Proposed Projects (Ongoing Projects or in the Pipeline)
MOLD/DOLIDAR.					
Market intelligence:					
Strengthen and rationalize the existing systems of agricultural market information and establish new sets of ICT products for market intelligence.	The improved market information system has become available in the SRC area.	Ensure that improved market information system which the public and private sectors are jointly developing will be introduced in the SRC area.	Strive for the establishment of an owned and functioning market information system among the main value chain stakeholders.	DOA Private sector Producers' cooperative, etc.	HO-1 (DN-13)
Market infrastructure:					
Promote the development of market infrastructure through the combination of public investment, PPP, (including cooperatives), and community participation.	The hub and spoke distribution networks of agricultural products have been developed, through the establishment of a new wholesale market in eastern Kathmandu, distribution center in Kurkhot distribution center, strategically located collection centers, and storages along the road networks.	Strategically network the main market infrastructures with collection centers along the road networks, in order to establish an efficient distribution system within and outside the area.	<ol style="list-style-type: none"> 1. Construct vegetable collection centers in selected pockets endowed with higher reliability of access, production potential, together with a strategic location to develop the area as a production center. 2. Construct the new vegetables wholesale market in the eastern part of Kathmandu. 3. Construct the distribution center of the agricultural products in Kurkhot. 4. Construct the new cold storage facilities at strategic locations in the network. 	MOAD DOA CRAD DADO Private sector Producers' cooperative, etc.	HO-1 HO-4 HO-5
Innovation:					
Promote innovative agribusiness enterprises through the combination of	Agricultural commercialization has been advanced due to the	Promote agricultural commercialization through utilization of the outreach	Facilitate stakeholders in applying and utilizing the outreach grant fund type system for the improvement of their value	MOAD Donors	(DN-1) (DN-4)

Long-term National Level Policies for Agricultural Commercialization (excerpts from ADS considered applicable for the SRC area)	Proposed Goals to be Achieved by 2020 for Agricultural Commercialization of the SRC area	Proposed Policies to be Adopted for Agricultural Commercialization of the SRC area	Proposed Actions (2014 - 2020)	Implementing Agency/Organization	Proposed Projects (Ongoing Projects or in the Pipeline)
tax incentives, innovation matching grant funds (e.g., outreach fund), and agribusiness incubators.	innovations introduced.	grant fund type system.	chains.	Private sector Producers' cooperative, etc.	
Trade:					
Strengthen capacity building to improve the ability to comply with the Sanitary and Phyto-Sanitary Measures (SPS), anti-dumping (AD), and counter-veiling duties (CVD) measures, with legislative, institutional, and international measures.	The conditions to export products to neighboring countries have been improved.	Start promoting the production of off-season vegetables that are marketable in Kathmandu and Terai Region as well as exportable to the Indian markets.	Progressively expand the production of off-season vegetables initially for the domestic market but aiming at the future exportation to India.	CRAD DADO Private sector Producers' cooperative, etc.	HO-1
Quality and safety:					
Strengthen regulations and institutions for enhancing food safety and quality, through enactment of the Modern Food Act, etc.	Food safety and quality regulations have been strengthened and the conditions for agricultural commercialization in this regard have become clearer than before.	Prior to the revisions of food safety and quality measures, start preparing for the forthcoming new regulations pre-engaging in safe and quality production.	<ol style="list-style-type: none"> 1. Conduct extension activities on the proper application of fertilizers and agro-chemicals. 2. Promote bulk production of the safe horticulture crops through unified production system. 3. Introduce and promote the grading system of products with improved packaging in order to strengthen the quality of confidence in the markets. 	DFTQC CRAD DADO Private sector Producers' cooperative, etc.	HO-1

8.2 Long List of the Projects

The long list of projects compiled for the master plan consists of 30 projects. Among them, ten are newly proposed by the Study, seven are ongoing as government projects/programs, and 13 are either ongoing or under preparation with the supports of donors.

The reason why this long list includes ongoing projects implemented either by government or donors is that, in order to understand the whole picture of the agricultural commercialization prospects in the study area as if it is one large program (i.e., a set of multiple projects), ongoing and planned activities concerning commercialization need to be looked at simultaneously, taking into account relationships such as synergies and complementarities among projects.

Hence, **although each of the ten newly proposed projects is independent, they have productive relationships with other ongoing and/or newly proposed projects. This means that newly proposed projects are designed as pieces that "fit" into one large picture of agricultural commercialization prospects for the study area towards 2020.**

Table 8.2 presents the long list of projects considered for the M/P.

Table 8.2: Project Long List for the Master Plan

#	VC*	Code**	Project Name	Implementing Body	Stage***
<u>1. Newly Proposed Projects by the Study</u>					
1	U/M/D	HO-1	Sindhuli Road Corridor Commercial Agriculture Promotion (SRCCAP)	DOA	New
2	U	HO-2	Strengthening of Junar Production System	DOA	New
3	U	HO-3	Non-conventional Irrigation	DOA, DOLIDAR	New
4	M	HO-4	Kurkhot Logistics Center and Associated Distribution Network	MOAD	New
5	D	HO-5	New Vegetables/Fruits Wholesale Market in Eastern Kathmandu	MOAD	UP
6	U/M/D	HO-6	Study for NTFP Promotion	MOFSC	New
7	U/M	LI-1	Sindhuli Road Corridor Traditional Livestock Production Strengthening (SRCTLPS)	DLS	New
8	U	LI-2	Genetic Improvement and Breeding of Dairy Animals	DLS	New
9	U	LI-3	Genetic Improvement and Breeding of Goats	DLS	New
10	U	LI-4	Consignment Mating of Dry Buffaloes for Milk Production and Genetic Improvement - Pilot	DLS	New
<u>2. Project/Programs Implemented by GON</u>					
11	U	GO-1	Continuous Expansion of Agricultural Services by DADO	DOA (DADO)	OG, UP
12	U	GO-2	Continuous Expansion of Livestock Services by DLSO	DLS (DLSO)	OG, UP
13	U	GO-3	Strengthening of the Functions of Agriculture and Livestock Development Centers in the Study Area	DOA, DLS	OG, UP
14	M/D	GO-4	Establishment of Fruits Juice Processing Plant	DOA, FNCCI/ AEC, Junar Central Coop., Producer	OG

#	VC*	Code**	Project Name	Implementing Body	Stage***
				Groups/Coops.	
15	U/M/D	GO-5	ODOP Program	DOA, FNCCI/AEC, Central/District Level ODOP Committees	OG
16	—	GO-6	Road Network Improvements (three bridges across major rivers by Department of Road (DOR), rural roads based on DTMPs 2014-2018)	DOR, DOLIDAR, DDC, VDC	OG
17	—	GO-7	Panchkhar SEZ (Kavre)	Ministry of Industry (MOI)	OG
3. Projects/Programs with Donor Supports					
18	U/M/D	DN-1	HIMALI (Dolakha)	DOA, ADB	OG (LN+TA)
19	U	DN-2	Community-Managed Irrigated Agriculture Project (CMIASP) Supports for famer-managed irrigation systems (FMIS)	DOI, ADB	OG (LN)
20	—	DN-3	Roads Connectivity Sector I (including Bridge across the Sunkoshi River in Kurkhot)	DOR, ADB	OG (LN)
21	U/M/D	DN-4	PACT (started operation in the SRC area in late 2013)	DOA, WB	OG (LN+TA)
22	U	DN-5	Poverty Alleviation Fund Project II (Small Irrigation Development in four districts)	WB, IFAD	OG (LN)
23	U	DN-6	Leasehold Forestry and Livestock Program (LFLP)	MOFSC,DOF, DLS	OG (LN)
24	U/M/D	DN-7	Rural and Agricultural Development Project in Ramechhap District	DOA, SDC	UP (TA)
25	U	DN-8	Vegetable Seed Project in Ramechhap, Phase 3	DOA, SDC	OG (TA)
26	U/M/D	DN-9	Girls Power Project	Plan Nepal	OG (TA)
27	—	DN-10	Volunteer Programs (JOCV, SV)	JICA	OG (TA)
28	U/M	DN-11	Establishing Sustainable Production and Supply System for High Value Agricultural Crops in the Hilly Areas of Sindhuli District	GLMI, local NGO	OG (TA)
29	U/M/D	DN-12	UNNATI	EU, CARE Nepal, CEAPRED	OG (TA)
30	D	DN-13	Market Information Improvement (within the framework of RISMFI)	ADB, FNCCI/AEC	OG (LN)

* VC = Value Chains, U = Upstream, M = Midstream, D = Downstream

** HO = Horticulture (and related) projects, LI = Livestock projects, GO = Government projects, DN = Donor assisted projects

*** OG = Ongoing, UP = Under Planning, (TA) = Technical Assistance, (LN) = Loan

Source: Study Team

The projects shown in the long list are diverse, in terms of not only their sectors and contents, but also geographical coverage, positions in the value chains, implementation period, implementation organization, and modalities.

The brief information of each project included in the long list is attached as Appendix 2.

8.3 Positions of Long-listed Projects in Respective Value Chains

Table 8.3 shows the positions of long-listed projects in their respective value chains, together with information on the zones and districts they are implemented.

Table 8.3: Coverage of Long-listed Projects with respect to Zoning, Districts and in the Value Chains

Categories	Horticulture												Livestock										Infrastructures / Facilities ****								Other					
	Vegetables						Fruits (Junar)						Dairy Animals					Goat																		
Zones *	1 2 3 4	1 2 3 4 5	1 3 5	1	1 2 3 4	1 2 3 4	1 2 2 2	1 2 2	1 2	1 2	1 2	-	1 3	1 2	1 2 3 4 5	1 2 2 2 5	1 2 3 4	1 2 2 2 5	1 2 3 4	1 2 3 4 5	1 2 3 4 5	5	-	-	-	3 4	-	-	-	-	5	-				
Districts **	K D R S	K D R S	R S	D	K D R S	R	R	S	K D S	S	S	-	S	S	K D R S	K D R S	S	K D R S	K D R S	K D R S	D	K D R S	K D R S	K D R S	K D R S	S	-	K D R S	K D R S	R S	D R S	D R S	D R S			
Project Codes in the Long List ***	HO -1	<u>GO</u> <u>-1</u>	GO -3	<u>DN</u> <u>-1</u>	<u>DN</u> <u>-4</u>	DN -7	<u>DN</u> <u>-8</u>	<u>DN</u> <u>-9</u>	<u>DN</u> <u>-10</u>	<u>DN</u> <u>-11</u>	<u>DN</u> <u>-12</u>	<u>DN</u> <u>-13</u>	HO -2	<u>GO</u> <u>-4</u>	<u>GO</u> <u>-1</u>	GO -3	DN -10	LI-1	LI-2	LI-4	<u>GO</u> <u>-2</u>	GO 3	LI-1	LI-3	<u>GO</u> <u>-2</u>	<u>DN</u> <u>-6</u>	HO -3	HO -4	HO -5	<u>GO</u> <u>-6</u>	<u>GO</u> <u>-7</u>	<u>DN</u> <u>-2</u>	<u>DN</u> <u>-3</u>	<u>DN</u> <u>-5</u>	HO -6	<u>GO</u> <u>-5</u>
Value Chains	Supply of Inputs	✓	✓	✓	✓	✓	✓	✓			✓		✓	✓				✓	✓	✓	✓		✓	✓	✓	✓								✓		
	Production	✓	✓		✓	✓	✓		✓	✓	✓		✓				✓	✓		✓	✓		✓	✓	✓	✓					✓	✓		✓	✓	✓
	Post Harvest Handling	✓	✓	✓		✓	✓		✓		✓	✓		✓				✓	✓																✓	✓
	Marketing	✓	✓		✓	✓	✓		✓	✓	✓	✓		✓				✓	✓																✓	✓
	Distribution	✓			✓	✓		✓						✓														✓	✓	✓			✓		✓	

* 1 Accessible Temperate, 2 Accessible Tropical, 3 Likely accessible Temperate, 4 Likely accessible Tropical, 5 Not accessible

** K: Kavre, D: Dolakha, R: Ramachhap, S: Sindhuli districts

*** Ongoing projects are indicated with underlined text with half tone.

**** Infrastructure projects were positioned in the table with respect to their expected function in the value chains.

As it can be observed in Table 8.3, donor-assisted projects in the vegetable subsector tend to cover the value chain towards the downstream side and infer the importance of strengthening value chain for this subsector. Moreover, this endorses the fact that commercialization activity takes place where accessibility has been improved.

8.4 Classification of Long-listed Projects

The projects included in the long list are classified by category (proposed and ongoing by government or donors) and sector/subsectors. The long list is presented in Table 8.4 below.

Table 8.4: Long Listed Projects by Category and Sector (Sub-sector) Coverage

Sectors/Subsectors		Proposed Projects by SRCAMP (10 projects)	Ongoing Government's Programs/Projects (7 projects/programs)	Ongoing* Donor Supported Projects (13 projects)	Total (30)
Horticulture	Vegetables	1 (HO-1)	2 (GO- <u>1</u> , <u>3</u>)	9 (DN-1, 4, 7, 8, 9, <u>10</u> , 11, 12, 13)	12
	Fruits (Junar)	1 (HO-2)	3 (GO- <u>1</u> , 4, 5)	1 (<u>DN-10</u>)	5
Livestock	Dairy	3 (<u>LI-1</u> , 2, 4)	2 (GO-2, <u>3</u>)	-	5
	Goat	2 (<u>LI-1</u> , 3)	2 (GO-2, <u>3</u>)	1 (DN-6)	5
Infrastructures/Facilities		3 (HO-3, 4, 5)	1 (GO-6)	3 (DN-2, 3, 5)	7
Other		1 (HO-6)	1 (GO-7)	-	2
Total		11	11	14	36**

Note: Projects shown in *underlined italic* are the ones covering more than one subsector.

* DN-7 has not yet started but currently under the pipeline.

** Total number of projects exceeds the number of projects in the long list, due to the cross-sectoral coverage of some projects.

Source: Study Team

The projects which are ongoing and under the pipeline for the master plan of SRCAMP are the given conditions that need to be taken into account. Hence, **the discussion for the A/P will proceed by taking ongoing and under planning projects as given and focusing only on newly proposed projects by the Study.**

8.5 Strategic Programming for the A/P

8.5.1 Logical Grounds for the Strategic Programming

There are a total of ten newly proposed projects in the Study, six of which are assigned with an “HO” code because they are related to horticulture subsector while four are assigned with an “LI” code since they are related to livestock subsector. However, their characteristics differ in various aspects and therefore, brief explanations on their differences are described in Table 8.5 below.

Table 8.5: Brief Descriptions of Newly Proposed Projects for SRCAMP M/P

#	Code	Project Name	Brief Description
1	HO-1	Sindhuli Road Corridor Commercial Agriculture Promotion (SRCCAP)	<ul style="list-style-type: none"> Expansion of SRCAMP's pilot approach for vegetable production and marketing through collection center arrangement. This project addresses the development scenario for Zones 1 to 4.
2	HO-2	Strengthening of Junar Production System	<ul style="list-style-type: none"> Introduction of the basic cultivation techniques of Junar, e.g., sapling, applying proper fertilizer and agro-chemicals, thinning, and pruning. This project addresses the production aspect of the development scenarios for Zones 1 and 3.
3	HO-3	Non-conventional Irrigation	<ul style="list-style-type: none"> Installation of irrigation systems that utilize the perennial mountain streams in mid-hill areas. This project aims at addressing the production aspect of the development scenarios for Zones 1 to 4.
4	HO-4	Kurkhot Logistics Center and Associated Distribution Network	<ul style="list-style-type: none"> Feasibility study and implementation for the potentiality of Kurkhot to function as an important logistics center after the completion of the nearby bridge crossing the Sunkoshi River, combined with the efficiency improvement of associated distribution network. This project enhances the effectiveness of the development scenarios for Zones 1 to 4.
5	HO-5	New Vegetables/Fruits Wholesale Market in Eastern Kathmandu	<ul style="list-style-type: none"> This project is under planning by GON but its site has not yet been secured. Once the site issue has been cleared, it should start with the study, which will be followed by implementation. Although this project is not located within the study area, this wholesale market is expected to function as an eastern gate of the capital's consumer market and enhance the effectiveness of the development scenarios for Zones 1 to 4.
6	HO-6	Study for NTFP Promotion	<ul style="list-style-type: none"> A study to verify the potential of NTFP promotion in the study area, from resource endowments to marketability. This project aims at addressing the development scenario for Zone 5.
7	LI-1	Sindhuli Road Corridor Traditional Livestock Production Strengthening (SRCTLPS)	<ul style="list-style-type: none"> Expansion of SRCAMP's pilot approach for livestock sector (milk and goat). Alignment with HO-1 during implementation is desirable. This project addresses the development scenarios for Zones 1 to 4.
8	LI-2	Genetic Improvement and Breeding of Dairy Animals	<ul style="list-style-type: none"> Improvement of the system for genetic improvement and breeding of dairy animals. This project encompasses the development scenarios for all five zones but more effective in Zones 1 to 4.
9	LI-3	Genetic Improvement and Breeding of Goats	<ul style="list-style-type: none"> Improvement of the system for genetic improvement and breeding of goats. This project encompasses the development scenarios for all five zones.
10	LI-4	Consignment Mating of Dry Buffaloes for Milk Production and Genetic Improvement – Pilot	<ul style="list-style-type: none"> Feasibility study of pilot project to verify the introduction of a new system of consigning dry buffaloes to a place where the elite stud bulls are kept. Genetic improvement and milk production increase are sought for in parallel through this activity. This project encompasses the development scenarios for all five zones but more effective in Zones 1 to 4.

Source: Study Team

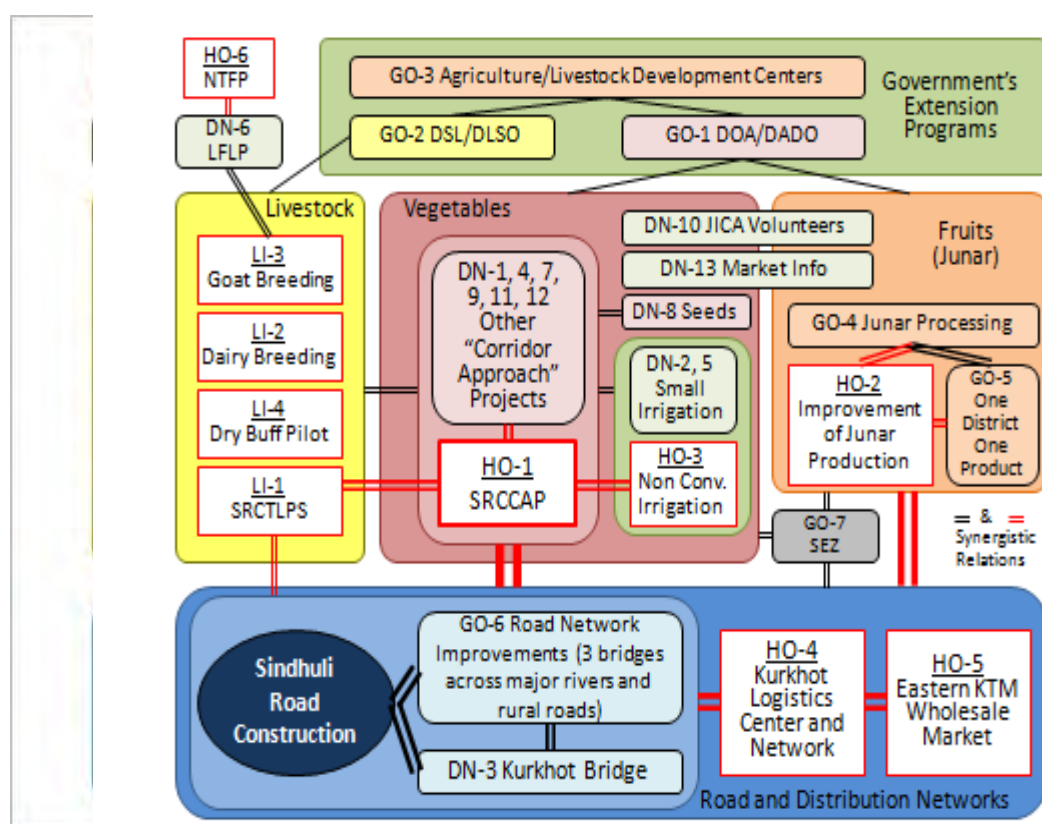
The ten newly proposed projects cover across different subsectors while they are more or less interrelated with each other as well as with other ongoing projects. The Study considers setting the priorities among different subsectors is irrelevant since they are all important. Hence, the Study does not adopt the conventional scoring method which compares the various parameters under the social,

economic, and environmental categories and compare their total scores in a horizontal manner.

Instead, **the Study adopted a qualitative approach which contemplated on the effective and strategic programming of the proposed projects based on their relationships against enhanced connectivity through the completion of Sindhuli Road and associated road networks.** In doing so, the relative importance of each newly proposed project will be discussed; taking into account the prospective synergies/complementarities that can be generated between the projects, added with social and economic impacts.

8.5.2 Strategic Programming from Synergy Aspect

Figure 8.1 shows the relationship between the 30 long-listed projects.



Source: Study Team

Figure 8.1: Relationship among 30 Long-listed Projects

Figure 8.1 explains the relationship, mainly in terms of synergy that the long-listed projects can generate together. The dual lines in the figure mean there are synergistic relationships between connected projects whereas their widths represent the strengths of the expected synergies. The dual lines in red color mean that they are connected in one or two ways with the newly proposed projects which are shown in red colored boxes.

Some remarks with regard to Figure 8.1 are presented below.

- Government programs placed on top of the figure are regarded as continuous activities that contribute to respective subsectors through research and extension. Quality, volume, and

relevance of the service contents to be delivered can make significant difference to the situation. Therefore, these programs are desired to be geared for the promotion of agricultural commercialization in the context of this master plan.

- The projects placed at the bottom of the figure, grouped as “Road and Distribution Networks,” are infrastructure projects including the Sindhuli Road construction which serves as the major premise of this master plan. Other road and bridge projects combined with Sindhuli Road will enhance the connectivity of the study area. The Kurkhot Logistics Center (HO-4) and Eastern Kathmandu Wholesale Market (HO-5) have synergistic relationship with road networks as a precondition. Other subsectors that are placed in the middle section of the figure also have synergistic relationship with the “Road and Distribution Networks,” especially in the case of the vegetables subsector.
- In the “Vegetables” subsector, there is a group of projects that can be categorized into one, with their commonality looking into the value chain of the vegetables with more or less taking advantage of the improved accessibility (or connectivity) of the area. They can be tentatively named as “corridor approach projects”, and one of the newly proposed projects, tentatively named SRCCAP (HO-1), falls under this category. All of these corridor approach projects combined will enhance each other in developing the study area as the production center of vegetables with the economy of scale, generating strong synergy with the road and distribution networks. Another newly proposed project in the vegetables subsector, i.e., non-conventional irrigation (HO-3), also has synergistic relationship with HO-1 in the production aspect.

Table 8.6 below explains the relations between the ongoing corridor approach projects and HO-1.

Table 8.6: Relations between Ongoing Corridor Approach Projects and HO-1

Code	Projects	Project Period	Area Coverage within the Target Districts	Notes
DN-1	HIMALI (ADB)	~ 2017	Dolakha only	Basically conducting the outreach fund type activity in response to the proposals submitted by the particular VC players. <u>Complementarities with HO-1 can be sought for.</u>
DN-4	PACT (WB)	~ 2015	All four districts	
DN-7	Rural Development Project (SDC)	2015 ~	Ramechhap only	Activity contents would be similar to HO-1 but only within part of Ramechhap. This would be a long-term commitment and therefore, <u>avoiding area duplication and seeking for complementarities and synergy between HO-1 would be needed.</u>
DN-9	Girls Power Project (Plan Nepal)	~ 2016	29 VDC +1 Mun.in Sindhuli District	This is a gender-oriented project. <u>Avoiding area duplication and seeking for complementarities and synergy between HO-1 would be needed.</u>
DN-11	Rural Development	~ 2014	Dumja VDC in Sindhuli District	This project will be completed by the middle of 2014. No particular attention

	nt Project (GLMI)		only	required.
DN-12	UNNATI	~ 2015	Sindhuli District only	This project is conducted and selected in VDCs along Sindhuli Road between Dumja and Kurkhot. <u>Avoiding area duplication and seeking for complementarities and synergy with HO-1 would be needed.</u>

Source: Study Team

- In the livestock subsector, SRCTLPS (LI-1) has synergistic relationship with both HO-1 and road networks, with HO-1 in the aspect of risk alleviation of the farm economy that will endeavor on vegetable production, and with the road networks in the aspect of milk collection network.
- In the fruits subsector, a newly proposed project which will address the production aspect of Junar (HO-2) is expected to generate a multitude of synergies with other ongoing projects. Combined together, they will take advantage of the road and distribution networks.
- Other newly proposed projects, i.e., breed improvement projects (LI-2 to LI-3) in the livestock subsector and NTFP study (HO-6) has no direct synergistic relationships with the road and distribution networks improvement.

By looking into the synergistic aspect of the newly proposed projects against road network improvement, among them, and with other ongoing projects, strategic importance in this respect has surfaced up. Table 8.7 below shows the summary of the strategic importance of the newly proposed projects.

Table 8.7: Strategic Importance of Newly Proposed Projects in respect of Synergies

#	Code	Project Name	Strategic Importance in terms of Synergy Aspect	Expected Level of Synergy
1	HO-1	Sindhuli Road Corridor Commercial Agriculture Promotion (SRCCAP)	This project has multiple synergistic relations. Among them, the most important is the synergy with road and distribution networks. Other synergies combined together are assumed to generate substantial social and economic impacts in the corridor.	High
2	HO-2	Strengthening of Junar Production System	Improvement of the production aspect of Junar has direct synergies with other ongoing projects concerning Junar. This project, if rightly designed with GO-2, will generate long-lasting synergies with relatively small inputs.	High
3	HO-3	Non-conventional Irrigation	This project can enhance the outcome of HO-1 when aligned together.	Medium
4	HO-4	Kurkhot Logistics Center and Associated Distribution Network	Because of Kurkhot's strategic location at the crossroad of the four directions that connect major consumption markets and emerging production areas, it has a high potential to grow as an important transit/forwarding point that can generate substantial social and economic impacts in a large public area. This is worth investigating in order to achieve productive use of road network through synergy.	High
5	HO-5	New Vegetables/Fruits	The necessity of this project is already endorsed by	High

#	Code	Project Name	Strategic Importance in terms of Synergy Aspect	Expected Level of Synergy
		Wholesale Market in Eastern Kathmandu	GON and it is expected to serve as the eastern gate of horticulture products into Kathmandu Valley. Realization of this project may possibly trigger the innovation of distribution system in the capital area if designed correctly.	
6	HO-6	Study for NTFP Promotion	Although seeking for the possibility to improve the welfare of people residing in non-accessible areas is important, this project is rather isolated in terms of synergy with other projects, especially with road networks.	Low
7	LI-1	Sindhuli Road Corridor Traditional Livestock Production Strengthening (SRCTLPS)	This project is the offspring of the pilot projects under the Study. It has synergistic relations with HO-1 in the aspect of farm economy resilience, i.e., constant income from dairy and substantial income from goat in time of emergency. Moreover, the day-to-day activities of farmers, e.g., milk collection at the collection center (CC), function to sustain and enhance the activities of the CC, which is also the focal point in the HO-1 activity.	High
8	LI-2	Genetic Improvement and Breeding of Dairy Animals	This project is important because once it has been successfully done, it will produce long lasting benefits for the populace. However, in terms of synergies with other projects including the road networks, its importance is low. This project is expected to be carried out with a well thought-out preparation in connection with the national system and should be carried out as a long-term project.	Low
9	LI-3	Genetic Improvement and Breeding of Goats	Same as above.	Low
10	LI-4	Consignment Mating of Dry Buffaloes for Milk Production and Genetic Improvement – Pilot	This project is worth implementing as it has been proven feasible in other parts of South Asia. However, in terms of synergy with other projects including the road networks, its importance is low.	Low

Source: Study Team

Based on the discussions above, the Study proposes to prioritize five newly proposed projects judged to generate high level of synergies, i.e., HO-1, HO-2, HO-4, HO-5 and LI-1.

8.5.3 Proposed Implementation Schedule

Based on the discussions above, the proposed implementation schedules of the long-listed projects are presented in Figures 8.2 and 8.3.⁵⁹ Figure 8.2 is organized according to the order listed in the long list, while Figure 8.3 is organized in accordance with sector/subsector categories. As a matter of course, **the proposed implementation schedules only apply to the newly proposed projects and they are only indicative.** Meanwhile the schedules for the ongoing projects (including those currently in the pipeline) are drawn based on their actual schedules.

Some remarks with regard to Figures 8.2 and 8.3 are presented in Table 8.8 below.

⁵⁹ In these figures, year 2015 is indicated with the characters on a colored background. This is because during year 2015, both Sindhuli Road and Khurkot Bridge are expected to be fully completed and the condition of transportation will be changed substantially.

Table 8.8: Notes on Proposed Implementation Schedule for the Newly Proposed Projects

#	Code (priority)	Project Name	Notes on the Proposed Implementation Schedule
1	HO-1 (priority)	Sindhuli Road Corridor Commercial Agriculture Promotion (SRCCAP)	Proposed to be implemented almost seamlessly following SRCAMP. Time is ripe for this project since road networks are progressively improving. A short preparatory study is also proposed prior to the formal launching.
2	HO-2 (priority)	Strengthening of Junar Production System	Proposed to be implemented rather early in order to undergird the fame of the target area as a Junar producing center through improved production, both in quality and quantity.
3	HO-3	Non-conventional Irrigation	Implementation aligned with HO-1 in a manner following the introduction of commercial production is proposed, in order to ensure the synergies between them.
4	HO-4 (priority)	Kurkhot Logistics Center and Associated Distribution Network	This feasibility study is proposed to be implemented from 2015 when both Sindhuli Road and Kurkhot Bridge will be fully opened.
5	HO-5 (priority)	New Vegetables/Fruits Wholesale Market in Eastern Kathmandu	Implementation timing of this project is dependent on land expropriation on site by GON.
6	HO-6	Study for NTFP Promotion	This study is proposed to be implemented when concerned authorities have decided to do so. However, the Study recommends them to compare the NTFP potential with other areas in the country prior to the launch of this study in order to revalidate the comparative advantage of the target area in a wider perspective.
7	LI-1 (priority)	Sindhuli Road Corridor Traditional Livestock Production Strengthening (SRCTLPS)	Proposed to be implemented in a staggered manner or in parallel with HO-1 in the same target pockets, in order to ensure the synergies/complementarities between them.
8	LI-2	Genetic Improvement and Breeding of Dairy Animals	This project is expected to be implemented with well thought-out preparation in connection with the national system. Hence, it should be implemented when ready with a long-term perspective.
9	LI-3	Genetic Improvement and Breeding of Goats	Same as above.
10	LI-4	Consignment Mating of Dry Buffaloes for Milk Production and Genetic Improvement - Pilot	This pilot project can be implemented in small scale when concerned parties are ready to commit.

Source: Study Team

#	Code	Project Name	Implementation by	Stage	Full Completion of Sindhuli Road														
					Year														
					2014		2015		2016		2017		2018		2019		2020 -		
1	2	1	2	1	2	1	2	1	2	1	2	1	2						
Newly Proposed Projects in SRCAMP	1	HO-1	Sindhuli Road Corridor Commercial Agriculture Promotion Project (SRCCAP)	DOA	New (TA)														
	2	HO-2	Strengthening of Junar Production System	DOA	New (TA)														
	3	HO-3	Non Conventional Irrigation	DOA, DOLIDAR	New (FS-GR)														
	4	HO-4	Kurkot Logistics Center and Associated Distribution Network	DOA (DABPMD)	New (FS-GR)														
	5	HO-5	New Vegetables/Fruits Wholesale Market in Eastern Kathmandu	DOA (DABPMD)	New (FS/BD-D/D-GR)														
	6	HO-6	Study for NTFP Promotion	MoFSC	New (ST)														
	7	LI-1	Sindhuli Road Corridor Traditional Livestock Production Strengthening (SRCTLPS)	DLS	New (TA)														
	8	LI-2	Genetic Improvement and Breeding of Dairy Animals	DLS	New (TA)														
	9	LI-3	Genetic Improvement and Breeding of Goats	DLS	New (TA)														
	10	LI-4	Consignment Mating of Dry Buffaloes for Milk Production and Genetic Improvement - Pilot	DLS	New (FS)														
Ongoing Government Projects	11	GO-1	Continuous Expansion of Agricultural Services by DADO	DOA (DADO)	Ongoing, Under Planning														
	12	GO-2	Continuous Expansion of Agricultural Services by DLSO	DLS (DLSO)	Ongoing, Under Planning														
	13	GO-3	Strengthening of the Functions of Agriculture and Livestock Development Centers in the Study Area	DOA, DLS	Ongoing, Under Planning														
	14	GO-4	Establishment of Fruits Juice Processing Plant	DOA, FNCCI/AEC, Junar Central Coop., Producer Groups/Coops.	Ongoing														
	15	GO-5	One District One Product (ODOP) Program	DOA, FNCCI/AEC, Central & District Level ODOP Committees	Ongoing														
	16	GO-6	Road Network Improvements (3 bridges across major rivers by DOR, rural roads based on DTMPs 2014-2018)	DOR, DOLIDAR, DDC, VDC	Ongoing														
	17	GO-7	Special Economic Zone Project (SEZP), Panchkhar, Kavre District	MOI	Ongoing														
Donor Supported Projects Ongoing or Under Planning	18	DN-1	High Mountain Agribusiness and Livelihoods Improvement Project (HIMALI) (Dolakha)	DOA, ADB	Ongoing (LN+TA)														
	19	DN-2	Community-Managed Irrigated Agriculture Project (CMIASP) (Support for FMIS)	DOI, ADB	Ongoing (LN)														
	20	DN-3	Roads Connectivity Sector I (incl. bridge across Sunkoshi River at Kurkot)	DOR, ADB	Ongoing (LN)														
	21	DN-4	Project for Agriculture Commercialization and Trade (PACT)	DOA, WB	Ongoing, expand in 2014 (LN+TA)														
	22	DN-5	Poverty Alleviation Fund Project II (Small Irrigation Development in 4 districts)	WB, IFAD	Ongoing (LN)														
	23	DN-6	Leasehold Forestry and Livestock Programme (LFLP)	MOFSC, DOF, DOL	Ongoing														
	24	DN-7	Rural and Agricultural Development Project in Ramechhap District	DOA, SDC	Under Planning (TA)														
	25	DN-8	Vegetable Seed Project in Ramechhap, Phase 3	DOA, SDC	Ongoing														
	26	DN-9	Income Generation Programme under "Girls Power Project"	Plan Nepal	Ongoing														
	27	DN-10	Volunteer Programs (JOCV, SV)	JICA	Ongoing														
	28	DN-11	Project for Establishing Sustainable Production and Supply System for High Value Agricultural Crops in the Hilly Areas of Sindhuli District	GLMI, local NGO	Ongoing (TA)														
	29	DN-12	UNNATI	EU, CARE Nepal, CEAPRED	Ongoing (TA)														
	30	DN-13	Market Information Improvement (within the framework of RISMF)	ADB, FNCCI/AEC	Ongoing														

Proposed schedule Proposed continuation of the activities as government's routine program Ongoing projects Ongoing program

Figure 8.2: Proposed Implementation Schedule of Newly Proposed Projects (with Ongoing Projects) in the Order of Long List

Sectors	VCs	#	Code	Project Name	Implementation by	Stage	Full Completion of Sindhuli Road															
							Year															
							2014		2015		2016		2017		2018		2019		2020		2020 -	
Horticulture	Vegetables	1	HO-1	Sindhuli Road Corridor Commercial Agriculture Promotion Project (SRCCAP)	DOA	New (TA)																
		11	GO-1	Continuous Expansion of Agricultural Services by DADO	DOA (DADO)	Ongoing Under Planning																
		13	GO-3	Strengthening of the Functions of Agriculture and Livestock Development Centers in the Study Area	DOA, DLS	Ongoing Under Planning																
		18	DN-1	High Mountain Agribusiness and Livelihoods Improvement Project (HIMALI) (Dolakha)	DOA, ADB	Ongoing (LN+TA)																
		21	DN-4	Project for Agriculture Commercialization and Trade (PACT)	DOA, WB	Ongoing, expand in 2014 (LN+TA)																
		24	DN-7	Rural and Agricultural Development Project in Ramechhap District	DOA, SDC	Under Planning (TA)																
		25	DN-8	Vegetable Seed Project in Ramechhap, Phase 3	DOA, SDC	Ongoing																
		26	DN-9	Income Generation Programme under "Girls Power Project"	Plan Nepal	Ongoing																
		27	DN-10	Volunteer Programs (JOCV, SV)	JICA	Ongoing																
		28	DN-11	Project for Establishing Sustainable Production and Supply System for High Value Agricultural Crops in the Hilly Areas of Sindhuli District	GLMI, local NGO	Ongoing(TA)																
	29	DN-12	UNNATI	EU, CARE Nepal, CEAPRED	Ongoing(TA)																	
	30	DN-13	Market Information Improvement (within the framework of FRISMF)	ADB, FNCCI/AEC	Ongoing																	
	Fruits (Janar)	2	HO-2	Strengthening of Junar Production System	DOA	New (TA)																
14		GO-4	Establishment of Fruits Juice Processing Plant	DOA, FNCCI/AEC, Junar Central Coop., Producer Groups/Coops.	Ongoing																	
11		GO-1	Continuous Expansion of Agricultural Services by DADO	DOA (DADO)	Ongoing Under Planning																	
13		GO-3	Strengthening of the Functions of Agriculture and Livestock Development Centers in the Study Area	DOA, DLS	Ongoing Under Planning																	
27		DN-10	Volunteer Programs (JOCV, SV)	JICA	Ongoing																	
Livestock	Dairy Animals	7	LI-1	Sindhuli Road Corridor Traditional Livestock Production Strengthening (SRCTLPS)	DLS	New (TA)																
		8	LI-2	Genetic Improvement and Breeding of Dairy Animals	DLS	New (TA)																
		10	LI-4	Consignment Mating of Dry Buffaloes for Milk Production and Genetic Improvement - Pilot	DLS	New (FS)																
	12	GO-2	Continuous Expansion of Agricultural Services by DLSO	DLS (DLSO)	Ongoing Under Planning																	
	Goats	7	LI-1	Sindhuli Road Corridor Traditional Livestock Production Strengthening (SRCTLPS)	DLS	New (TA)																
		9	LI-3	Genetic Improvement and Breeding of Goats	DLS	New (TA)																
12		GO-2	Continuous Expansion of Agricultural Services by DLSO	DLS (DLSO)	Ongoing Under Planning																	
23	DN-6	Leasehold Forestry and Livestock Programme (LFLP)	MOFSC, DOF, DOL	Ongoing																		
Infrastructure / Facilities	3	HO-3	Non Conventional Irrigation	DOA, DOLIDAR	New (FS-GR)																	
	4	HO-4	Kurkot Logistics Center and Associated Distribution Network	DOA (DABPMD)	New (FS-GR)																	
	5	HO-5	New Vegetables/Fruits Wholesale Market in Eastern Kathmandu	DOA (DABPMD)	New (FS/BD-D/D-GR)																	
	16	GO-6	Road Network Improvements (3 bridges across major rivers by DOR, rural roads based on DTMPs 2014-2018)	DOR, DOLIDAR, DDC, YDC	Ongoing																	
	17	GO-7	Special Economic Zone Project (SEZP), Panchkhar, Kavre District	MOI	Ongoing																	
	19	DN-2	Community-Managed Irrigated Agriculture Project (CMIASP) (Support for FMIS)	DOI, ADB	Ongoing (LN)																	
	20	DN-3	Roads Connectivity Sector I (incl. bridge across Sunkoshi River at Kurkot)	DOR, ADB	Ongoing (LN)																	
22	DN-5	Poverty Alleviation Fund Project II (Small Irrigation Development in 4 districts)	WB, IFAD	Ongoing (LN)																		
Other	6	HO-6	Study for NTFP Promotion	MoFSC	New (ST)																	
	15	GO-5	One District One Product (ODOP) Program	DOA, FNCCI/AEC, Central & District Level ODOP Committees	Ongoing																	

Proposed schedule Proposed continuation of the activities as government's routine program Ongoing projects Ongoing program

Figure 8.3: Proposed Implementation Schedule of Newly Proposed Projects (with Ongoing Projects): in the Order of Sector/Sub-sector

8.6 Strategic Environmental Assessment (SEA)

There is no specific procedure in conducting SEA in Nepal. Meanwhile, GON and the concerned government institutions have suggested carrying out SEA based on the Environment Protection Act of 1996. After consultation with environmental experts familiar in this field of practice in Nepal, the Study conducted SEA on the ten newly proposed projects in the long list by treating them as one integrated set, according to the general SEA method.

(1) Consideration of the Alternatives

The alternatives applicable to the ten newly proposed projects can be divided into three types, i.e., (i) with project, (ii) with project but after appropriate revision, and (iii) without project. In the case of (ii) with project but after appropriate revision, adjustment in size, location, combination of components, adoption of different technology, etc., can be considered, according to their characteristics. For the actual adjustment, it should be considered at the time those projects are to be implemented, in accordance with the guidelines applicable in Nepal.

(2) Scoping

Scoping is conducted by adopting the JICA Guidelines for Environmental and Social Considerations 2010, since it is considered comparably more exhaustive than the guidelines of Nepal.

(3) Evaluation of Impacts

Evaluation of the impacts according to each component in scoping is carried out and presented in Table 8.9. As a result, all newly proposed projects were evaluated to have no serious social and environmental impacts, with the condition that projects that are subject for Initial Environmental Examination (IEE) and Environmental Impact Assessment (EIA) under the current regulation in Nepal should take appropriate procedures.

The indicators of evaluation adopted are defined as follows.

A: Significant impact

B: Moderate impact

C: No information obtained (Further study is needed)

D: None or minor impact

+: Positive

-: Negative

Table 8.9: Scoping and Impact Assessment for Newly Proposed Projects

No.	Components	Evaluation	Remarks of Impacts
1	Involuntary Resettlement	C	<ul style="list-style-type: none"> Depending on the wholesale market site [HO-5] not yet secured by GoN, further study is recommended as necessary. If there is any adverse impact, alternative plans and mitigation measures shall be considered.
2	Local Economy (Employment and Livelihood)	A+	<ul style="list-style-type: none"> The common theme of all projects [HO-1 to LO-4] is to promote agricultural commercialization which activates the local economy in order to improve livelihood. Notably, [HO-1] aims to develop the study

No.	Components	Evaluation	Remarks of Impacts
			area as a vegetable production center with the economy of scale and plans to be practiced in parallel with [LO-1] as the risk-hedge function of farm economy.
3	Utilization of Land and Local Resources	B+	<ul style="list-style-type: none"> Cultivation areas are expanded through the introduction of irrigation facilities [HO-3]. The study for NTFP promotion [HO-6] is to make the most of local resources including the non-accessible areas.
4	Social Institutions (Social Capital and Local Decision-making Institutions)	B+	<ul style="list-style-type: none"> HO-1, HO-2, HO-3, and LI-1 are designed to work on or work through producer groups or cooperatives for their internal management as well as for the development of business linkage with other value chain stakeholders. These increasing interactions will enrich social capital. Local decision-making system is strengthened through cooperative system.
5	Existing Social Infrastructures and Services	B+	<ul style="list-style-type: none"> Increase of active producer groups of cooperatives leads to enhance the provision of social services.
6	Vulnerable Social Groups (Poor and Indigenous People)	C	<ul style="list-style-type: none"> While commercialization is said to widen the gap between rich and poor, facilities such as non-conventional irrigation [HO-3] and collection center [HO-4] are accessible to vulnerable people.
7	Gender	D	<ul style="list-style-type: none"> All projects are designed irrespective of gender barrier.
8	Children's Rights	D	<ul style="list-style-type: none"> Increased income may be spent for child education.
9	Equality of Benefits and Losses	D	<ul style="list-style-type: none"> No negative impact is assessed.
10	Equality in the Development Process	D	<ul style="list-style-type: none"> No negative impact is assessed.
11	Local Conflicts of Interest	D	<ul style="list-style-type: none"> No negative impact is assessed.
12	Infectious Diseases (HIV/AIDS)	D	<ul style="list-style-type: none"> No negative impact is assessed.
13	Working Conditions including Occupational Safety	D	<ul style="list-style-type: none"> No negative impact is assessed.
14	Geographical Features	D	<ul style="list-style-type: none"> No negative impact is assessed.
15	Groundwater	C	<ul style="list-style-type: none"> When selecting the target area installed with irrigation system [HO-3], water rights should be equally entitled to farmers.
16	Soil Erosion	B+	<ul style="list-style-type: none"> Introduction of forage planting on the slopes of the mountains [LI-1] prevents soil erosion.
17	Fauna and Flora, Biodiversity	C	<ul style="list-style-type: none"> Few negative impacts are assessed, however, further research is recommended as necessary.
18	Climate	D	<ul style="list-style-type: none"> No negative impact is assessed.
19	Landscape	D	<ul style="list-style-type: none"> No negative impact is assessed.
20	Protected Area	D	<ul style="list-style-type: none"> No negative impact is assessed.
21	Management of Abandoned Sites	D	<ul style="list-style-type: none"> No negative impact is assessed.
22	Climate	D	<ul style="list-style-type: none"> No negative impact is assessed.

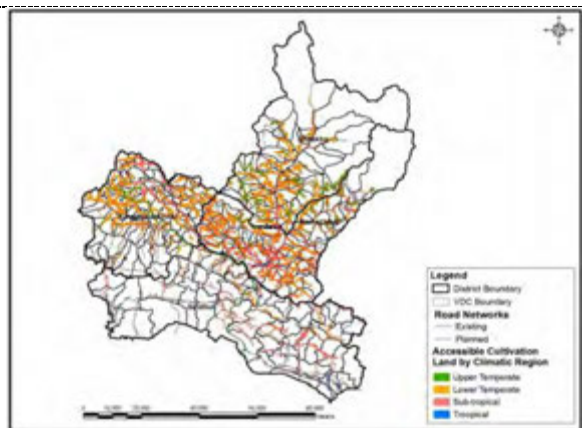
No.	Components	Evaluation	Remarks of Impacts
	Change/Global Warming		
23	Air Quality	D	<ul style="list-style-type: none"> No negative impact is assessed.
24	Water Quality	C	<ul style="list-style-type: none"> Fertilizers and agrochemicals are used [HO-1, HO-2] therefore, proper handling is necessary.
25	Soil Quality	C	<ul style="list-style-type: none"> Fertilizers and agrochemicals are used [HO-1, HO-2] therefore, proper handling is necessary. Waste disposal from Kurkhot Logistics Center [HO-4] and the wholesale market in Eastern Kathmandu [HO-5] should be regulated.
26	Waste	C	<ul style="list-style-type: none"> Waste management should be put into practice especially in setting relatively large-scale facilities [HO-4, HO-5].
27	Noise and Vibration	C	<ul style="list-style-type: none"> Noise and vibration may occur during the construction of Kurkhot Logistics Center [HO-4] and the wholesale market in Eastern Kathmandu [HO-5]. Therefore, mitigation measures such as sound barriers should be considered necessary.
28	Subsidence	D	<ul style="list-style-type: none"> No negative impact is assessed.
29	Odor	D	<ul style="list-style-type: none"> No negative impact is assessed.
30	Accidents	D	<ul style="list-style-type: none"> No negative impact is assessed.

Source: Study Team

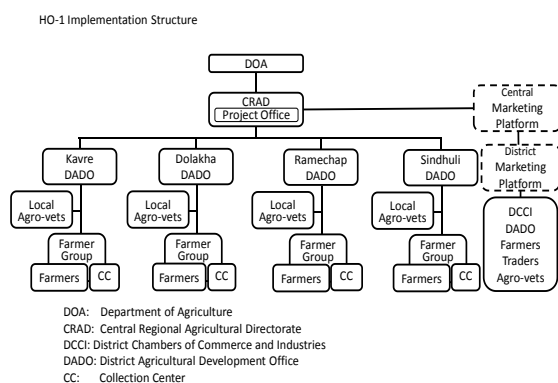
In the next Chapter, the A/Ps for five prioritized projects will be presented.

Project Code/Project Title:	HO-1/Sindhuli Road Corridor Commercial Agriculture Promotion
Implementation Period:	2014–2019 (5 years)
Target Area/Beneficiaries:	Accessible area from the major road potential for vegetable production within the four districts/3,400 beneficiary farmers in the final project year of 2019.
Implementing Agency:	CRAD of DOA, MOAD, and DADO.
Supporting Agency/ Organization:	FNCCI, AEC, DCCI, and other value chain participants including agro-vets, traders, and wholesalers.
<p>Background and Objectives:</p> <p>The project is formulated based on the following development potential in the SRC area for the commercialization of agriculture:</p> <ol style="list-style-type: none"> 1) Rapidly growing demand for vegetables in the Kathmandu metropolitan area due to higher population growth and a change in food consumption pattern; 2) Contrarily, decreasing trend of vegetable production in suburban agriculture which currently supplies vegetables in Kathmandu metropolitan area, due to rapid expansion of urbanization area; 3) High expectation on the improvement of access from the SRC area to the Kathmandu Valley after the completion of the Sindhuli Road; the farmers in the SRC area will gain opportunities for more production and sale of vegetables for consumers in and around the Kathmandu metropolitan area. 4) Positive outcomes demonstrated in the SRCAMP pilot projects in terms of the high performance of farmers in vegetable production applying “unified standard production” technique and marketing of their products using the collection centers through the establishment of new relationships with traders; and 5) Comparative advantage of the SRC area to supply off-season vegetables to Terai, because the SRC area encompasses the various agro-ecological regions. <p>The project promotes agricultural commercialization in line with strategic direction of agriculture sector in the hill/mountain areas of Nepal. The completion of the Sindhuli Road enhances connectivity between the agricultural production pockets along Sindhuli Road and Kathmandu metropolitan areas as well as Terai Region.</p> <p>Taking advantage of this opportunity, the project aims to increase the incomes of farm households located in the agricultural production pockets in the hill/mountain areas along Sindhuli Road Corridor by gradually shifting from subsistence farming to commercial farming, which means that produced vegetables will be traded in the market. Eventually, the increase in farmers’ incomes contributes to the improvement of rural economy. The project, therefore, focuses on the establishment of linkage between production side and market side, which makes it easier to exchange production information in pocket areas and information of market demand (Demand-oriented Approach). In other words, as far as the existence of the demands are ensured and properly communicated to the producers, the crops to be produced under this project can be flexibly adjusted, including emerging commodities as well as for processing.</p>	

Location Map of the Target Area:



Implementation Structure:



Photos:



The farmers in the pilot project performed well in the production and sale of vegetables by applying a unified standard production system and using the collection center introduced by SRCAMP.

Outline of the Project:

Overall Goal:

A value-chain for HVCs is established in the SRC area.

Project Purpose:

Agricultural income of the target farm households in the selected production pockets along SRC is increased through agricultural commercialization.

Outcome:

1. Farming system for producing marketable crops is established in producers' groups.
2. Capability of the private sector in farm inputs supply, provision of technical guidance for crop production, and marketing services provided for the producers' groups are improved qualitatively and quantitatively.
3. Skills and capacities of the counterpart agency for the implementation and coordination of projects conducted through agricultural commercialization promotion are improved.

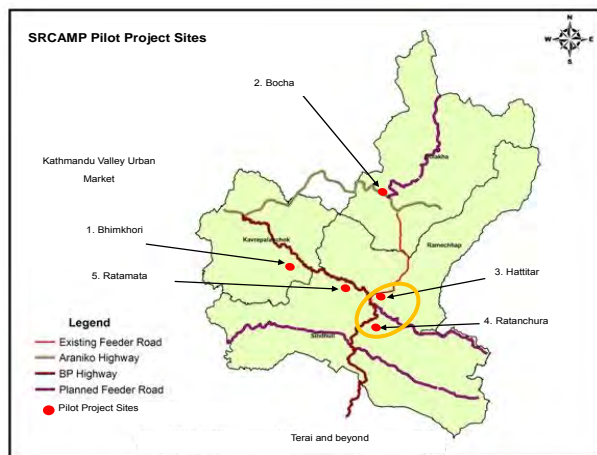
Activities/Schedule:	Year (2014-2020)						
	14	15	16	17	18	19	20
<u>Activities for Output-1:</u>							
1-1 Select potential producers' groups.	-	-	-	-	-		
1-2 Provide technical guidance for the unified standard production system of the producers' groups.	-	-	-	-	-		
1-3 Support the construction of collection centers, through cost sharing with producers' groups.	-	-	-	-	-		
1-4 Support the smooth operation of the collection centers, with its development to become a hub for agricultural commercialization through multi-functional operation.	-	-	-	-	-		
1-5 Introduce sorting and packing system to improve transport efficiency.	-	-	-	-	-		
1-6 Support the preparation of cropping calendars corresponding to market information.	-	-	-	-	-		
<u>Activities for Output-2:</u>							
2-1 Introduce the collective purchasing system of production material.	-	-	-	-	-		
2-2 Support the organization of periodical farmer-trader meetings.	-	-	-	-	-	-	-
2-3 Provide technical training for agro-vets.	-	-	-	-	-		
2-4 Support the establishment and operation of a platform for the promotion of agricultural commercialization.	-	-	-	-	-	-	-
<u>Activities for Output-3:</u>							
3-1 Assist C/P agency in coordinating with related agencies during project implementation.	-	-	-	-	-	-	-
3-2 Support weekly site monitoring of producer's groups activities conducted by JT/JTAs in DADO.	-	-	-	-	-	-	-
3-3 Support the organization of the monthly District Progress Review Committees (DPRCs) chaired by DADO.	-	-	-	-	-	-	-
3.4 Support the organization of annual project progress and review committees at the central level chaired by MOAD/CRAD with attendance of related officers and JT/JTAs in DADO.	-	-	-	-	-	-	-
Inputs:							
1. Experts				2. Others			
1) Team Leader/Agricultural Extension: 60 PM				1) Construction of collection center.			
2) Marketing and Distribution: 20 PM				2) Agricultural materials including micro drip irrigation system, plastic sheet, and spray.			
3) Farmer Organization & Management: 20 PM							

<p>4) Coordinator: 60 PM Total 160 PM</p>	<p>3) Farm inputs such as seeds, fertilizers, and agrochemicals. 4) Construction of MWUS. 5) Training/workshop/meeting. 6) Field facilitators. 7) Project office operational cost.</p>
<p>Indicative Cost of the Project: Rs.582.7 million (USD 6.0 million) International consultants/experts are assumed to be hired for technical assistance.</p>	
<p>Estimated Benefits: Incremental return of a beneficiary farmer who produces vegetables in one Ropani (500 sqm) open field and 60 sqm plastic house is estimated to be Rs.96,000 (USD 994). The total incremental return derived from 3,400 beneficiary farmers in the final project year of 2019 is estimated at Rs.327.6 million (USD 3.38 million). Beside the incremental return of beneficiary farmers, agro-vets are expected to gain an additional income from an increase in sale of agricultural materials and farm inputs estimated to be Rs.92.3 million (USD 953,000) during the project.</p>	
<p>Remarks for Project Implementation:</p> <ol style="list-style-type: none"> 1) The project will be implemented by sharing the cost with beneficiary farmers. They will bear 50% of the cost of materials (e.g., plastic house) and farm inputs (e.g., fertilizers) within the first year of their participation in the project and 70% within the second year. From the third year, 100% of these costs shall be paid by the beneficiary farmers. 2) In the above indicative cost, all the costs required for project implementation are allocated with the exception of daily extension and coordination activities to be additionally made by the counterpart agency for the smooth implementation of the project. 3) Facilities such as collection center and plastic house will be built with local materials and labor. 4) The importance of cooperation between farmers and other market players such as traders should be strongly reminded and disseminated for smooth operation and to avoid unnecessary conflicts during project implementation. 5) Remind to accept fair profit not only for farmers but for all market players including agro-vets and traders. 6) Establishment of a marketing platform is proposed as a place for discussion and decision making for commercialized agricultural development, e.g., selection of seasonal marketable crops based on market information from traders. The platform will be established in both central and district levels. A conceptual membership at the central level is FNCCI/AEC, DOA, CRAD, DADO, and representative farmers, while DCCI, DADO, representative farmers, and agro-vets at the district level. 	

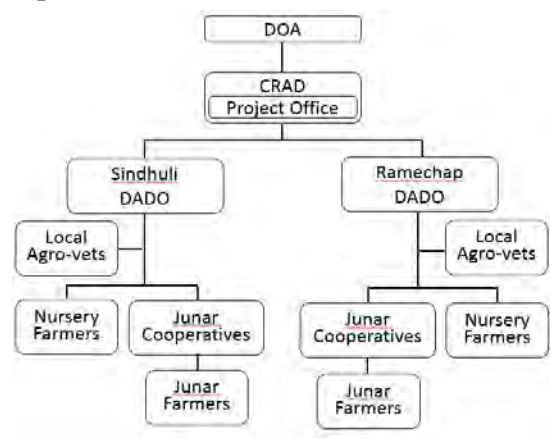
Project Code/Project Title:	HO-2/Strengthening of Junar Production System
Implementation Period:	2014–2019 (5 years)
Target Area/Beneficiaries:	Junar production area in Sindhuli and Ramechhap districts/1,360 beneficiary farmers in the final project year of 2019.
Implementing Agency:	DADO, DOA, CRAD, and MOAD.
Supporting Agency/Organization:	DDC and NARC, Private sector related agencies; FNCCI, AEC, DCCI, Junar Central Cooperative Union, and District Junar Cooperatives.
<p>Background and Objectives:</p> <p>Junar is an acknowledged fruit commodity produced in the two districts. According to statistics, the Junar cultivation area in the two districts is about 1,900 ha with 4,300 farmers producing 17,900 t in 2011/12 season. Based on these figures, the average annual cultivation area and production per farmer are estimated at 0.44 ha and 4.16 t, respectively.</p> <p>Orchards are generally located at disadvantageous areas. Their locations are on steep hill far off the main roads. The local government is enthusiastically working for improvement to generate more income for farmers residing at those disadvantageous remote areas involving cooperatives and working with the ODOP program. However, the condition in individual farms still remains at low level. Lack of appropriate information is a cause to inhibit improvement. The farmers have never calculated nutrient requirement in the design fertilization plan, and never cared about fertilizer design. They have applied whatever is available at minimal quantity. Consequently, their production remains low and unstable.</p> <p>In the pilot project which was designed based on the above findings, an advantageous effect of the improved techniques for Junar production was confirmed. Although harvesting work is still on-going and the final results of production increase and quality improvement are not fully obtained as of the end of November 2013 (the harvest is scheduled to be completed in January 2014). Pilot project farmers and JT/JTA reported that there are significant differences between Junar trees with and without fertilizer application treatments and pruning introduced by the pilot project. The proposed project is therefore formulated to expand the improved techniques covering more Junar farmers by strengthening extension services. Under the project, the improved techniques will be introduced to 1,360 Junar farmers or about 32% of the total Junar farmers in the two districts.</p> <p>Improved techniques will be disseminated through cooperatives. As the production areas are widely spread under different climatic and geographic conditions, single design of treatment may not be adoptable to all areas, hence careful analysis for each treatment needs to be designed. Horticulturist specializing in orchard management will be included accompanied by extension services. Selected farmers will be trained to become field facilitators in order to enhance the efficiency of extension services. Also, local agro-vets will be involved for the smooth supply of farm materials and inputs. For the efficient procurement of input materials, the producers' groups will be trained as well.</p> <p>There is another critical issue in Junar production. The epidemic of citrus greening disease has been identified within the area. Spread of this disease easily destroys the production area. Countermeasure against this problem must be included as a component of the project.</p> <p>Two screen houses for the production of clean sapling is recommended to be built in farmer plots with technical assistance on nursery management. The screen houses are expected to implement experimental operation in establishing the total management system of nursery for improved clean sapling production for distribution to target farmers.</p>	

The project aims to improve the total system of Junar production from nursery to orchard. Clean sapling and improved orchard management expect to increase not only current production but also to alleviate the possible future damages from the dreadful disease.

Location Map of Target Area:



Implementation Structure:



Photos:



Orchard on the steep hill



Properly pruned tree



Comparison between treatments

Outline of the Project:

Overall Goal:

Stable and economically feasible Junar production system settled in the area.

Project Purpose:

Improved production system with proper countermeasure against the greening disease is established for Junar.

Outputs:

4. Appropriate design of orchard management is established in each production site in the two districts.
5. Appropriate input materials become available for target farmers.
6. Improved nurseries are established in the two districts.
7. Disease-free improved saplings with appropriate rearing are distributed to target farmers.

Activities:

Extension of improved production techniques

1. Basic analysis of production condition.
 - 1-1 Implement baseline survey of production.
 - 1-2 Analyze baseline for recommendation.

Year (2014-2020)

	1	2	3	4	5	6	7
1-1	-	-	-	-	-		
1-2	-	-	-	-	-		

2. Design of production calendar based on analysis.						
2-1 Design fertilizer and pesticide application.	-	-	-	-	-	
2-2 List annual work schedule on calendar.	-	-	-	-	-	
3. Implementation of designed treatment.						
3-1 Orientation with field demonstration.	-	-	-	-	-	
3-2 Delivery of input materials.	-	-	-	-	-	
3-3 Field implementation.	—————					
4. Extension and monitoring.						
4-1 Preparation of monitoring plan.	-	-	-	-	-	
4-2 Training JT and FF for monitoring.	-	-	-	-	-	
4-3 Implement field monitoring.	—————					
Efficient procurement of input materials						
1. Form groups for aggregate procurement.						
1-1 Arrange to form procurement group in the cooperative.	-	-	-	-	-	
1-2 Establish the management unit of the group.	-	-	-	-	-	
1-3 Training for accounting work.	-	-	-	-	-	
2. Arrangement of agro-vets within the area.						
2-1 Identification of local agro-vets.	-	-	-	-	-	
2-2 Technical training of input materials for Agro-vets.	—————					
2-3 Promote a routine communication between farmers and agro-vets.	—————					
3. Implementation and monitoring of negotiation.						
3-1 Arrange initial negotiation.	-	-	-	-	-	
3-2 Establish ordering system.	-	-	-	-	-	
3-3 Monitor through activities.	—————					
Preventive system for epidemic disease						
1. Analysis of current condition.						
1-1 Baseline data collection.	-					
1-2 Analysis of collected data.	-					
2. Design of countermeasure.						
2-1 Design clean nursery.	-					
2-2 Building screen house for nursery.	-					
2-3 Listing of alternative countermeasure.	-	-				
3. Establish management system of a clean nursery.						
3-1 Prepare facility management manual.	-	-				
3-2 Inspect the manual on site.	-	-	-			
3-3 Settle the verified manual.	-	-	-			
4. Distribution of improved sapling.						
4-1 Identify and list the target farmers.	-					
4-2 Plan and implement distribution.				-	-	

5. Extension of disease prevention management.							
5-1 Extend improved sapling technique to local nursery farmers.					—		
5-2 Extend preventive disease management for farmers.					—		
Inputs:							
1. Experts				2. Others			
1 Horticulture in orchard management (20 PM)				Farm materials and inputs			
2 Agro inputs (fertilizers and pesticides) (10 PM)				Subsidiary funding for screen house			
3 Plant pathology (10 PM)				Trainings/workshops			
				Field facilitators			
				Office operational cost			
Indicative Cost of the Project: Rs.104.3 million (USD 1,076,000)							
Estimated Benefits:							
<u>Number of beneficiary in production improvement:</u>							
The project supports Junar farmers by organizing producer groups. In the first year, four groups with 100 farmers will be supported. The number of groups and farmers will increase every year during the project, and a total of 55 groups with 1,360 farmers are planned to be covered by the project.							
<u>Improvement in production:</u>							
Traditional practice produces about 200 kg per optimal tree (8-10 years old in good condition). Pilot treatment improved the production to about 350 kg for the same optimal tree. Production is expected to increase by about 70% through implementation of the practice. An average of 15 trees per farmer is designed to be treated by the project. However, there are limited numbers of optimal trees; therefore, the actual increase per tree is less than the result observed in the pilot project. If the expected increase from the treatment is set at 50% of the optimal, increase in the annual production will be about 1,500 tons in the final project year of 2019. The sales value is also expected to increase by about Rs.30,000,000 in the final project year of 2019 as well. The recommended practice will improve the quality as well as quantity; therefore, unit price is also expected to increase.							
<u>Area of improved sapling distributed:</u>							
Install two screen houses (200 sqm/house) that will have a capacity to rear 8,000 saplings. If 50% survival rate is assumed, 4,000 saplings will be distributed each year from the experimental screen house, which will replace 20 ha of Junar orchard from traditional to virus free sapling.							
Remarks for Project Implementation:							
1) Facilities (screened house for nursery) will be built in the private nursery farmers' field. The property will be privately owned, thus, the project may assist to subsidize part of the cost.							
2) Production of appropriate sapling will take about three years, so the distribution can start after three years. Nursery farmers who receive subsidy must accept the condition of a 3-year rearing of sapling in order to supply healthy saplings.							
3) The project will request beneficiary farmers to pay a certain part of the cost of input materials following the cost sharing concept to be introduced by the project.							
4) The distribution of sapling from nursery farmers will start in the final project year. Accordingly, outcomes from the improved clean sapling production and distribution will be difficult to evaluate during the project. Thus, DADO proposes to monitor the effects of clean sapling after the project by involving the researchers of NARC.							

Project Code/Title:	HO-4/Kurkhot Logistics Center and Associated Distribution Network Improvement
Implementation Period:	Four Years
Target Area/Beneficiaries:	Kurkhot, Sindhuli District and along the strategic roads (including BP Highway-Sindhuli Road) linking with Kurkhot/benefit large populace.
Implementing Agency:	Directorate of Agri-business Promotion and Market Development (DABPMD), DOA, MOAD.
Supporting Agency/Organization:	DOR, FNCCI/AEC

Background and Objectives:

Full completion of both Sindhuli Road (BP Highway) and the bridge across the Sunkoshi River in Kurkhot expected during 2015 will provide favorable conditions for the shipment/distribution of agricultural products in the study area. Given that Kurkhot’s strategic location at the crossroad of four directions (China-India borders for north-south axis and Eastern Nepal-Kathmandu for east-west axis) connecting major consumption markets and emerging production areas, it has high potential to grow as an important transit/forwarding point. This project intends to establish a logistics center with multiple functions (e.g., collection, storage in room or cold temperature, grading, packaging, and forwarding) which is possibly combined with other service functions such as agro-inputs and extension in Kurkhot, linked with a network of collection centers strategically located along the major roads.

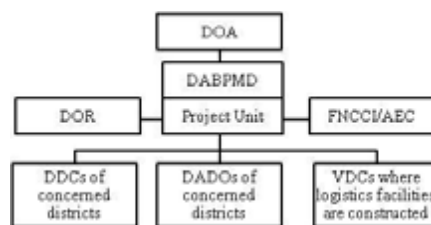
The project components are as follows:

- 1) Feasibility study with strategic planning of the efficient distribution network;
- 2) Design and construction of the facilities including the Kurkhot Logistics Center and associated collection centers linked with a network; and
- 3) Establishment of an efficient management system to operate the network as a whole.

Location Map of Target Area:



Implementation Structure:



DOA: Department of Agriculture
 DABPMD: Directorate of Agri-business Promotion and Market Development
 DOR: Department of Road
 FNCCI/AEC: Federation of National Chambers of Commerce and Industry
 DDC: District Development Committee
 DADO: District Agricultural Development Office
 VDC: Village Development Committee

Photos:



Collection Center under construction at Kurkhot (December 2013)

Outline of the Project:									
Overall Goal: Contribute to the social and economic development of the areas linked with the distribution network.			Outputs: 1. The main logistics facilities of agricultural products in the target area including Kurkhot Logistics Center and associated collection centers are constructed. 2. Efficient distribution system of the agricultural products with operational linkage between production and consumption areas is established.						
Project Purpose: Improve the efficiency of the distribution system of agricultural products which originated from within/outside of the target area along the strategic roads, through the establishment of the transit/forwarding facility in Kurkhot as well as the network of collection centers in strategic locations.									
Activities/Schedule			Year (2014-2020)						
			'14	'15	'16	'17	'18	'19	'20
1. Feasibility study of the efficient distribution network with strategic planning.				■					
2. Design and construction of facilities.									
2-1. Design/construction of Kurkhot Logistics Center.					■	■			
2-2. Design/construction of collection centers.					■	■			
3. Establishment of the efficient management system.									
3-1. Develop linkages with demand side for stable transaction.						■	■		
3-2. Develop local transportation system to collect products from scattered small production pockets.						■	■		
3-3. Attract and manage effective transport functions.						■	■		
Inputs:									
1. Experts 1-1. Logistics Development 1-2. Logistics Operation 1-3. Marketing 1-4. Facility Design		2. Facilities 2-1. Logistics center 2-2. Collection centers		3. Equipment 3-1. Equipment for operation of the logistics center and collection centers.					
Estimated Cost of the Project (indicative only): Rs.198 million (USD 2.05 million)									
Estimated Benefits: To be verified in the feasibility study.									
Remarks for Project Implementation:									
<ul style="list-style-type: none"> DABPMD of MOAD has already started the construction of a small size collection center facility at the site leased (for free) from a land owner (private college) in Kurkhot, with the intention of operating the facility in a public-private partnership (PPP) modality. The Market Management Committee consists of farming households in locality are already established. To date, perimeter walls and an office facility with three rooms and a toilet has been constructed. As a next step, DABPMD intends to construct a shed of approximately 1,000 sqm. This small collection center would start its operation in 2014 in the earliest case, with an ordinary primary level collection function. HO-4 activity should consider its existence into account. Coordination with DOR and DDCs/VDCs may potentially expand the scope of HO-4 to cover the development of multi-functional service areas (such as for resting, dining, sightseeing) along the highway which may also contribute to the social/economic development along the corridor. 									

Project Code/Project Title:	HO-5/New Vegetables/Fruits Wholesale Market in Eastern Kathmandu (NVFWM)
Implementation Period:	2014-2017 (3 years)
Target Area/Beneficiaries:	The location of NVFWM is in the eastern part of the Kathmandu metropolitan area. Beneficiaries are mainly the market participants in the value chain in the central region including farmers, local and central traders, wholesalers, retailers, and consumers.
Implementing Agency:	Ministry of Agricultural Development
Supporting Agency/ Organization:	ABPMDD of DOA, FNCCI/AEC, and private sector
Background and Objectives:	
<p>The necessity of a new vegetables/fruits wholesale market in the Kathmandu metropolitan area was recognized far ahead of time not only by GON but also by all market participants in the value chain mainly in the central region. There is no wholesale market functioning in an integrated manner in the Kathmandu metropolitan area. GON also considered that improvement in the agricultural marketing system is a key element for commercialization of agriculture. Due to the above situation, GoN conducted the Study on the Agricultural Marketing Development Project from 2000–2001 under the assistance of JICA. In phase 1, the study prepared a master plan for the development of the agricultural marketing system of the whole country. Subsequently, in phase 2, action plans were formulated for the development of a marketing system in priority areas selected in the master plan. The establishment of the New Vegetables/Fruits Wholesale Market in Kathmandu (NVFWM) was one of the action plans formulated in the Study. Unfortunately, this action plan has not been implemented, and the situation of agricultural marketing system remains the same as that of 2001 (rather becoming worse).</p> <p>At present, a wide variety of agricultural markets exists discursively in the Kathmandu metropolitan area, e.g., Kalimati Wholesale Market, New Baneshwor Market, Balaju Collection Center, and Kabhresthali Collection Center. Under such circumstances, it is difficult to consolidate an effective and efficient marketing system in which mass transportation, stable supply system, and fair price formation mechanism can be introduced and quality standards and complex transaction form can be improved.</p> <p>In order to solve these problems, the present function of wholesale markets in the Kathmandu metropolitan area should be consolidated into NVFWM. In the case of the existing Kalimati Wholesale Market, its function should be converted into a multipurpose urban-type retail market. At present, adequacy of this market as a wholesale market is low due to its location at the center of the metropolitan area, and accordingly, traffic of large-sized vehicles is strictly controlled during daytime hours.</p>	

Location Map of Target Area:

Implementation Structure:

Source: Study on the Agricultural Marketing Development Project, 2001, JICA

This implementation structure will be revised in the proposed basic design study.

Photos:



Kalimati Wholesale Market

Outline of the Project:

Overall Goal:

To consolidate effective and efficient agricultural marketing system in which mass transportation, stable supply system, and fair price formation mechanism are introduced, and quality standards and complex transaction form are improved.

Project Purpose:

To improve the agricultural marketing system in and around Kathmandu Valley by the establishment of NVFWM in Kathmandu metropolitan area.

Outcome:

1. Land for the construction of NVFWM is acquired.
2. The Study on the Agricultural Marketing Development Project, 2001 is updated, and the basic design study report is prepared.
3. Detailed design report is prepared.
4. The NVFWM is constructed.
5. The administration organization of NVFWM is properly arranged.

Activities/Schedule:

1. Land acquisition for the construction of NVFWM.
 - 1.1 Survey to secure an appropriate land.
 - 1.2 Explanation to land owners.
 - 1.3 Agreement with land owners on the acquisition.

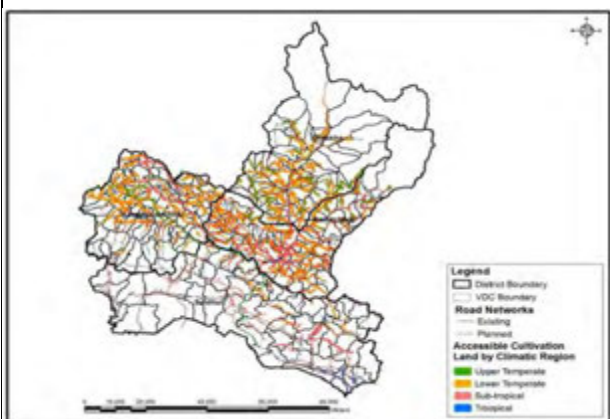
Year (2014-2020)

1	2	3	4	5	6	7
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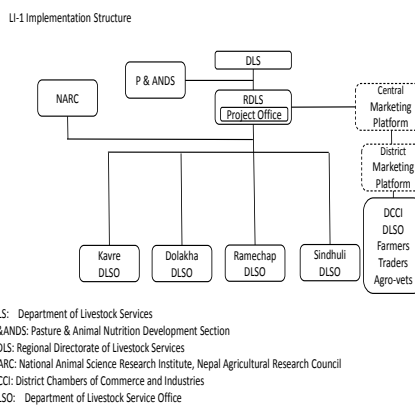
<p>1.4 Budget arrangement.</p> <p>1.5 Sales contract with land owners.</p> <p>2. Updating of the Study on the Agricultural Marketing Development Project, 2001, and preparation of the basic design study report.</p> <p>2.1 Request for assistance from donor agency.</p> <p>2.2 Agreement with donor agency on S/W after mutual consultation.</p> <p>2.3 Implementation of the Study under the assistance of the donor agency.</p> <p>3. Preparation of the detailed design report.</p> <p>3.1 Implementation of the detailed design study.</p> <p>4. Construction of NVFWM.</p> <p>4.1 Agreement on loan or grant with donor agency.</p> <p>4.2 Selection and prepared contract with contractor.</p> <p>4.3 Construction work.</p> <p>5. Arrangement of the administration organization of NVFWM.</p> <p>5.1 Staff recruitment for administration of NVFWM.</p> <p>5.2 Training of staff.</p>	
Inputs:	
<p>1. Experts</p> <ul style="list-style-type: none"> - Team Leader/Agricultural Market: 6 P/M - Vegetable and Fruit Market: 6 P/M - Farming Community/Organization: 4 P/M - Post-harvest Handling: 4 P/M - Facility Design/Cost Estimate: 10 P/M - Environment: 2 P/M - Project Evaluation: 3 P/M -Construction Supervision: 12 P/M <p>Total 47 P/M</p>	<p>2. Other</p>
Estimated Cost of the Project:	
<p>The total cost for the relevant studies and construction works including supervision at preliminary level is estimated at Rs.155 million (USD 1.6 million), if international consultants are assigned. However, the land acquisition cost is not included in this cost estimates.</p>	
Estimated Benefits:	
<p>All participants in the value chain including farmers, local and central traders, wholesalers, retailers, and consumers will benefit from the following:</p> <ol style="list-style-type: none"> 1) City entry time restriction; 2) Reduced quantity loss (due to faster, better handling, packing, and storage); 3) Time and cost savings from a more efficient marketing system; and 4) Quality loss reduction. 	

Project Code/Project Title:	LI-1/Sindhuli Road Corridor Traditional Livestock Production Improvement
Implementation Period:	2014–2019 (5 years)
Target Area/Beneficiaries:	Accessible area from major roads with potential improvement of livestock production within the four districts/1,000 goat farmers and 1,000 dairy farmers organized into a total of 40 producer groups during the project.
Implementing Agency:	Department of Livestock Services (DLS), Regional Directorate of Livestock Services (RDLS), District Livestock Services Offices (DLSO), and dairy cooperatives.
Supporting Agency/ Organization:	Pasture & Animal Nutrition Development Section (P&ANDS), Animal Production Directorate (APD), National Animal Science Research Institute, Nepal Agricultural Research Council (NARC), and private sector.
Background and Objectives:	
<p>The demand for milk is assumed to grow further with population growth and urbanization advancement of Kathmandu Valley and local towns. The milk supply of the neighboring country, India, in 2009 is 43.6 kg/capita/year which is 1.3 times higher than Nepal (FAOSTAT). There is a room for potential demand for milk in Nepal, since production never catches up with consumption. Trend of goat meat production is increasing at 3.5% which is about the same ratio as population growth (2002-2011, FAOSTAT). The price of goat meat is rapidly rising annually at an average of 15% during the recent five years (MOA). Therefore, the demand for goat meat is also assumed to be growing.</p> <p>After completion of the Sindhuli Road in 2015, sales opportunity of livestock products is supposed to be extended in order to improve distribution of agricultural products toward Kathmandu in the targeted four districts. Farmers will be provided chance for transition from self-sufficiency production to commercial production. This will require the production techniques of livestock products to meet market needs and knowledge of integrated farm management.</p> <p>This project aims to expand the techniques verified from pilot projects about the increasing milk yield of individual animals and increasing weight of goats in addition to its economic efficiency through improvement of feeding methods. Besides, the project causes the earning rate of milk and goat to increase due to reduced feeds costs that accounts for the majority of production costs through the execution of an increase in the production of roughage adapted in each project site, which is a very important feed for ruminant animals such as buffalo, cow, and goat.</p> <p>In addition, the project supports dairy cooperatives organized by milk producers to improve milking and feeding techniques for production of good quality milk and intensify techniques for testing of milk quality, because it is necessary to produce good standard milk for sale.</p>	

Location Map of Target Area:



Implementation Structure:



Photos:



Measurement of goat body weight



Making soil blocks for the tree nursery in the group activity.



Feeding roughage and concentrate mixed ration to buffaloes.

Outline of the Project:

Overall Goal:

A value-chain for high value commodities (HVCs) is established in the SRC area.

Project Purpose:

Agricultural income of the target farm households in the selected production pockets along Sindhuli Road Corridor is increased through agricultural commercialization.

Outputs:

8. Farming system for producing marketable livestock products is established in producer groups.
9. Capability of the private sector in farm inputs supply, provision of technical guidance for dairy and goat production, and provision of marketing services for the producer groups is improved qualitatively and quantitatively.
10. Skills and capacity of the counterpart agency for the implementation and coordination of projects conducted through agricultural commercialization promotion are improved.

Activities/Schedule:

Activities for Output-1:

- 1-1 Select potential dairy and goat producer groups.
- 1-2 Provide technical guidance of improved production system to the producer groups.
- 1-3 Introduce quality control system to improve marketing efficiency.

	Year (2014-2020)						
	14	15	16	17	18	19	20
1-1	—	—	—	—	—		
1-2	—	—	—	—	—		
1-3	—	—	—	—	—		

<p><u>Activities for Output-2:</u></p> <p>2-1 Introduce the collective purchasing system of production materials.</p> <p>2-2 Support the organization of farmer-trader meetings/trainings.</p> <p>2-3 Support the establishment and operation of a platform for promotion of agricultural commercialization.</p> <p><u>Activities for Output-3:</u></p> <p>3-1 Assist C/P agency in coordinating with related agencies including private sector during project implementation.</p> <p>3-2 Support weekly site monitoring of producer groups activities conducted by JT/JTAs in DLSO.</p> <p>3-3 Support the organization of the monthly District Progress Review Committees (DPRCs) chaired by DLSO.</p> <p>3.4 Support the organization of annual project progress and review committees at the central level chaired by MOAD/RDLS, Central with attendance of related officers and JT/JTAs in DLSO.</p>	<table border="1" style="width: 100%; height: 100%;"> <tr> <td style="width: 10%;"></td> <td style="width: 10%;"></td> <td style="width: 10%;"></td> <td style="width: 10%;"></td> <td style="width: 10%;"></td> <td style="width: 10%;"></td> <td style="width: 10%;"></td> <td style="width: 10%;"></td> <td style="width: 10%;"></td> <td style="width: 10%;"></td> </tr> <tr> <td></td> <td style="text-align: center;">—</td> <td style="text-align: center;">—</td> <td style="text-align: center;">—</td> <td style="text-align: center;">—</td> <td style="text-align: center;">—</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td colspan="9" style="text-align: center;">-----</td> </tr> <tr> <td></td> <td colspan="9" style="text-align: center;">-----</td> </tr> <tr> <td></td> <td colspan="9" style="text-align: center;">-----</td> </tr> <tr> <td></td> <td colspan="9" style="text-align: center;">-----</td> </tr> <tr> <td></td> <td colspan="9" style="text-align: center;">-----</td> </tr> <tr> <td></td> <td colspan="9" style="text-align: center;">-----</td> </tr> </table>												—	—	—	—	—						-----										-----										-----										-----										-----										-----								
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Inputs:																																																																																	
<p>1. Experts</p> <p><u>International Expert</u></p> <p>- Feeding Management: 18 PM</p> <p><u>National Expert</u></p> <p>-Fodder Production: 15 PM</p> <p>-Milk Quality Management: 10 PM</p>	<p>2. Others</p> <p>Concentrate feeds</p> <p>Nursery materials for fodder tree</p> <p>Seeds of fodder tree</p> <p>Training and meeting</p> <p>Field facilitator remuneration</p> <p>Marketing platform at the central and district levels</p> <p>Project office operational cost</p>																																																																																
Indicative Project Cost: Rs.156.4 million (USD 1.62 million)																																																																																	
Estimated Benefits:																																																																																	
<p>Tangible benefit in the final project year of 2019 is estimated to be Rs.49,203,200 (USD 507,825) from a total of 2,000 beneficiary farmers in 40 sites. Based on this figure, incremental benefit per farm household is estimated at Rs.24,600 (USD 254). Breakdown of the benefit is as follows:</p> <p>1) Increment of milk yield of lactating buffaloes is estimated at 400 liters per head (from 1,200 L to 1,600 L) or Rs.16,000 with improved feeding practice. The total increment from a target of 1,920 buffalo heads for a period of five years is then estimated at 768,000 L or Rs.30.72 million.</p> <p>2) Increment of milk yield of lactating cows will be 300 liters per head (from 1,500 L to 1,800 L) or Rs.9,000 also with improved feeding practice. The total increment from a target of 800 cow heads for a period of five years is estimated at 240,000 L or Rs.7.2 million.</p> <p>3) Increment weight gain of goat per head is estimated at 8.6 kg or Rs.3,526. The total increment from a target of 3,200 goat heads for a period of five years is estimated at 27,520 kg or Rs.11.28</p>																																																																																	

million.

The intangible benefits of the project are described as follows:

- 1) Shipping age of goats (targeted live weight is 30 kg) will be shortened by 217 days, from 677 days at present to 460 days with the project.
- 2) Quality and quantity of roughage will be improved and labor time for roughage collection and transport will be reduced, because at least 15,000 fodder trees will be transplanted during the project.

Remarks for Project Implementation:

This project is proposed to be implemented combined with HO-1/Sindhuli Road Corridor Commercial Agriculture Promotion considering the importance of livestock sector in the farmers' economy and their livelihood. Animals such as buffaloes, cows, and goats are easily converted into cash when farmers need money. On the other hand, vegetables for sale are not always safe as major income source, because price fluctuation is very high compared with cereals and livestock products, and easily damaged by unexpected climate change. In addition, livestock produces manure/compost which is essentially important for vegetable production. Milk and meat are also important in their livelihood as a significant source of nutrients.

The proposed technical improvement undertaken by the project for dairy and goat subsectors are the introduction of the following:

- 1) Feed formulation techniques to meet the nutrient requirements during lactation period,
- 2) Roughage and concentrate mixed feeding techniques,
- 3) Feed supplement techniques for goats,
- 4) Feed formulation techniques to meet the nutrient requirements and flushing practices,
- 5) Techniques for production and distribution of hygienic milk including milk quality test at collection point, and
- 6) Establishment of fodder tree nursery and encourage fodder production.

CHAPTER 10 CONCLUSION AND RECOMMENDATIONS

10.1 Conclusion

The Study presented the M/P for the agricultural commercialization of the SRC districts towards 2020, with the overall goal to contribute to the livelihood improvement of the rural population in the Sindhuli Road Corridor area through high value commercial agricultural promotion.

The Study, over a two and a half year period, went through the steps as briefly summarized in the following:

- (1) The Study has analyzed the situation of the study area including the selected value chains of potential commodities and identified the constraints for agricultural commercialization mainly within the weak linkages in the distribution system which can be subdivided into accessibility, production, and trading.
- (2) The countermeasures to address those constraints were deliberated and the draft of the basic development strategy for agricultural commercialization of the study area was formulated as DBDS, followed by the pilot projects to verify its validity.
- (3) A set of pilot projects with horticulture and livestock components combined with marketing activities were conducted for approximately 14 months and generally completed with satisfactory results verifying approaches proposed in DBDS. The various lessons and findings generated through the experience in the pilot projects, such as the importance to look into the resilience of farming households against potential risks they could be faced with in the process of commercialization, and the substantial positive differences the introduction of simple technical measures adaptable to the area can formulate, were taken into consideration during the revision of DBDS into BDS.
- (4) A master plan for agricultural commercialization of the study area towards 2020, which consist of zoning, BDS, policy matrix, project long list, and action plans was formulated.
 - The **zoning** conducted for the study area was based on two main axes, i.e., accessibility and agro-ecological aspects, and considering climatic difference, the scenarios for the five identified zones were formulated using practical concepts progressively rolling out interventions where accessibility has improved.
 - The **BDS** was formulated in a way the DBDS was updated based on the lessons and findings generated through the pilot projects.
 - The **policy matrix** which recommends policy makers to consider agricultural commercialization policy and activities for the study area towards 2020 was presented.
 - The **long list** of projects consisting of 30 projects including ten newly proposed projects by the Study as well as 20 ongoing government and donor supported projects was provided, aiming at presenting the whole picture of the ongoing and planned activities for agricultural

commercialization of the study area towards 2020.

- A strategic programming was conducted focusing on the synergistic aspect between the long-listed projects, and five projects were prioritized from among the ten newly proposed projects for its early implementation.
- The *A/P* for the five prioritized projects were formulated and proposed, including its detailed descriptions.

As summarized above, the proposed M/P has good grounds for its validity and applicability, and taking these into consideration, the Study Team has concluded that the proposed action plan should be implemented as early as possible. Grasping the opportunity to accelerate the emerging trend of agricultural commercialization will ascertain the status of the study area to grow as one of the major production centers of HVCs in Nepal.

10.2 Recommendations

For the implementation of the proposed projects, a substantial amount of financial resource is necessary. However, the Study Team believes that through the implementation of the priority projects selected and proposed for the action plan, a relatively early realization of the outcomes which are sustainable beyond 2020, can be expected. This is because they are prioritized based on their synergistic relationships mainly with road network improvements that are currently taking place with an effect that will remain for a long time, and because business-oriented activity which characterizes agricultural commercialization, once it properly took off, will sustain itself with the economic motives of the stakeholders combined with the multiplier effects of new entries.

Hence, the Study Team recommends the MOAD and concerned parties to implement the prioritized projects as proposed in the action plan, by assuring the budget allocations internally as well as securing the support of donor agencies.

A few additional recommendations that the Study Team would like to make are the following:

- (1) Agricultural commercialization naturally entails the risk inherent to market mechanisms and the prices of the commodities often fluctuate. Therefore, the measures to hedge such risks should be established in the intervention, e.g., to maintain the balance between vegetables and staple crop and/or livestock production as well as to control the pace of shifting towards HVCs; and
- (2) To promote agricultural commercialization in the study area, the MOAD is recommended to promote the policies and actions described in the policy matrix as well as in BDS. In doing so, the major roles that public sector players are expected to perform are facilitations in various fronts in order to create a conducive environment and opportunities for producers and private sector players to strengthen their ties, as was initiated and proposed in the Study.

REFERENCES

- ADB. (2007) Commercial Agriculture Development Project Document.
- ADDCN. (2001). 'Findings and Recommendations of Joint GoN - Donor Review'. Kathmandu: Association of District Development Committees of Nepal.
- AEC, (2002) "Commodity wise leaflets on tea, floriculture, vegetable seeds, dairy, poultry". Kathmandu: Agro-Enterprise Center.
- AEC, (2004). "A Study Report on Trade Competitiveness of Vegetable Seeds", Kathmandu: Agro-Enterprise Center.
- AED. (2008). Pocket Profile, 2007/08, Agriculture Extension Directorate (AED), Harihar Bhawan, Kathmandu, Nepal
- Agribusiness promotion and Marketing Development Directorate. (2011). Agriculture Marketing Information Bulletin, 2012 of Agribusiness promotion and Marketing Development Directorate, 2011. Department of Agriculture, Lalitpur, Nepal
- Agribusiness promotion and Marketing Development Directorate. (2012). Agriculture Marketing Information Bulletin, 2012 of Agribusiness promotion and Marketing Development Directorate, 2012. Department of Agriculture, Lalitpur, Nepal
- Agribusiness Promotion and Marketing Development Directorate. 2012. Cost of Production and Marketing Margins of Cereals, Cash, Vegetables and Spices Crops, Nepal (2011/12). Agribusiness Promotion and Marketing Development Directorate, Department of Agriculture, Lalitpur, Nepal
- Agricultural Extension Directorate (2007 and 2008). Agricultural Extension Programme Implementation Directives 2061/62 and 2062/63, (Nepali version), Harihar Bhawan: Department of Agriculture, Agricultural Extension Directorate
- Agricultural Perspective Plan Nepal - From Vision to Action, John W. Mellor. Paper presented on November 22, 2006, Kathmandu, Nepal. Agriculture Workshop Organised by the World Bank and the National Planning Commission, 22 - 23 November 2006
- Agricultural Sector Performance Review (ASPR) 2002 - Asian Development Bank and MOAD
- Agriculture Extension Directorate. (2013). Annual Programme and Statistical Book, 2011/2012. Agriculture Extension Directorate, Department of Agriculture, Hariharbhawan, Lalitpur
- Agriculture, Irrigation and Forestry, Government's Position Paper presented at Nepal Development Forum 2004
- Nepal Agricultural Research Council , Annual Reports, 2003/04 - 2011/12, Nepal Agricultural Research Council, Kathmandu, Nepal.
- Agricultural Development Bank . Annual Reports, 2003/04 - 2011/12. Agricultural Development Bank, Kathmandu, Nepal.
- MOAD . Annual Reports, 2003/04 - 2011/12, MOAD, Kathmandu, Nepal.

Department of Agriculture . Annual Reports. 2003/04 - 2011/12. Department of Agriculture, Harihar Bhawan, Nepal.

ANZDEC Limited, (2002) Nepal: Agriculture Sector Performance Review (ADB TA No. 3536-NEP) Main Report prepared for MOAD and Asian Development Bank. ANZDEC: New Zealand.

Netra B. Chhetri, Applied Geography, 31 (2011)808-819, “Climate sensitive measure of agricultural intensity: Case of Nepal”, Elsevier Ltd., USA

APROSC, 1999, “A study on Exploring Market Potential of Selected High Value Commodities in Mid-Western Developing Region Nepal, Final Report”, Agriculture Projects Services Center. Kathmandu Nepal

APROSC/JMA, (1995), Agriculture Perspective Plan (APP), Kathmandu: APROSC and John Mellor Associates.

APROSC/JMA. 1997. ‘Nepal Interim Agriculture Perspective Plan (Final Report)’. ADB TA - 2618-NEP. Kathmandu: APROSC and John Mellor Associates.

CBS (2003) Population Monograph of Nepal, Central Bureau of Statistics: Kathmandu.

CBS (2004a) Statistical Yearbook Nepal, 2003; Kathmandu: Central Bureau of Statistics: National Planning Commission.

CBS (2004b) Nepal Living Standards Survey 2003/04 (Volume 1 and 2), Kathmandu: Central Bureau of Statistics.

CBS (2004c) National Sample Census of Agriculture Nepal 1991/1992 and 2001/2002; Central Bureau of Statistics. Kathmandu:

CBS, (2004) “National Sample Census of Agriculture Nepal 2001/02 (Development Region Central) ”, Central Bureau of Statistics, Kathmandu Nepal

CBS, (2004), “National Sample Census of Agriculture Nepal 2001/02 Dolkha District ”, Central Bureau of Statistics, Kathmandu Nepal

CBS, (2004), “National Sample Census of Agriculture Nepal 2001/02 Kavre District”, Central Bureau of Statistics, Kathmandu Nepal

CBS, (2004), “National Sample Census of Agriculture Nepal 2001/02 Rammehap District ”, Central Bureau of Statistics, Kathmandu Nepal

CBS, (2004,) “National Sample Census of Agriculture Nepal 2001/02 Sindhuli District ”, Central Bureau of Statistics, Kathmandu Nepal

CBS (2005) Statistical Pocketbook Nepal, (2004) Central Bureau of Statistics, Kathmandu.

CBS, (2005). “ Poverty Trends in Nepal (1995-96 and 2003-04)”, Central Bureau of Statistics. Kathmandu Nepal

CBS. (2007), “Statistical Year Book of Nepal 2007”, Central Bureau of Statistics: Kathmandu Nepal

CBS. (2008). Census of Manufacturing Establishment, 2006/07. Central Bureau of Statistics (CBS), Kathmandu, Nepal

CBS. (2009). Nepal Labor Force Survey Report, 2008/09. Central Bureau of Statistics (CBS), Kathmandu, Nepal

CBS. (2011 a). National Accounts of Nepal. Central Bureau of Statistics (CBS), Kathmandu, Nepal

CBS. (2011 b). Preliminary Results of National Living Standard Survey, 2010/. Central Bureau of Statistics (CBS), Kathmandu, Nepal

CBS. (2011 c). Preliminary Results of National Population Census, 2011. Central Bureau of Statistics (CBS), Kathmandu, Nepal

CBS. (2011 d). Poverty in Nepal: Summary Report prepared from Nepal Living Standard Survey III, 2010/11. Central Bureau of Statistics (CBS), Kathmandu, Nepal

CBS. (2012). National Population and Housing Census (National Report). Central Bureau of Statistics, National Planning Commission, Kathmandu, Nepal

CBS. (2013) a. National Accounts of Nepal, Central Bureau of Statistics, Kathmandu, Nepal

CBS. (2013) b. Small Area Estimate of Poverty in Nepal (Summary report). Central Bureau of Statistics, National Planning Commission, Kathmandu, Nepal

CBS/WFP. (2006). Small Area Estimation of Poverty, Caloric Intake and Malnutrition in Nepal. Central Bureau of Statistics (CBS), Nepal, United Nations World Food Programme (WFP), Nepal and The World Bank, Nepal

Center for Development and Governance (2001) Small and Medium Enterprise Development in Nepal". Kathmandu: Center for Development and Governance.

DADO Dolakha. (2012). Annual Progress Report of DADO, Dolakha 2011/12. District Agriculture Development Office, Dolakha

DADO Kavre. (2012). Annual Progress Report of DADO, Kavre 2011/12. District Agriculture Development Office, Kavre

DADO Ramechhap. (2012). Annual Progress Report of DADO, Ramechhap 2011/12. District Agriculture Development Office, Ramechhap

DADO Sindhuli. (2012). Annual Progress Report of DADO, Sindhuli 2011/12. District Agriculture Development Office, Sindhuli

DADO Sindhuli. (2010). "Annual Agriculture Development Programme 2008/09", District Agriculture Development Office. Sindhuli, Nepal

DADO Ramechhap. (2010). "Annual Agriculture Programme and Statistical Book 2008/09", District Agriculture Development Office. Ramechhap, Nepal

DADO Dolakha. (2010). "Annual Agriculture Programme and Statistical Book 2008/09" District Agriculture Development Office. Dolakha, Nepal

DADO Kavre. (2010). “Annual Agriculture Programme and Statistical Book 2008/09”, District Agriculture Development Office. Kavre Nepal

DDC Dolakha. (2013) b. District Annual Development Plan of Dolakha District (2013/14). District Development Committee, Dolakha

DDC Dolakha. (2013) a. District Transport Master Plan of Dolakha District (2013-2018). District Development Committee, Dolakha

DDC Kavre. (2013) a. District Transport Master Plan of Kavrepalanchok District (2013-2018). District Development Committee, Kavrepalanchok

DDC Kavre. 2013 b. District Annual Development Plan of Kavrepalanchok District (2013/14). District Development Committee, Kavrepalanchok

DDC Ramechhap. (2013) a. District Transport Master Plan of Ramechhap District (2013-2018). District Development Committee, Ramechhap

DDC Ramechhap. (2013) b. District Annual Development Plan of Ramechhap District (2013/14). District Development Committee, Ramechhap

DDC Sindhuli. (2013) a. District Transport Master Plan of Sindhuli District (2013-2018). District Development Committee, Sindhuli

DDC Sindhuli. (2013) b. District Annual Development Plan of Sindhuli District (2013/14). District Development Committee, Sindhuli

DDC, 2007, “District Annual Plan 2007/08” District Development Committee, Sindhuli

DDC. (2010), “Periodic District Development Plan 2001/02 to 2006/07” District Development Committee, Kavrepalanchok

DDC. (2010), “Periodic District Development Plan 2001/02 to 2006/07” District Development Committee, Ramechhap

DDC. (2010), “Periodic District Development Plan 2002/03 to 2006/07” District Development Committee, Dolakha.

DDC. (2011). “Annual Plan of District Development Committee, 2011/12. District Development Committee, Ramechhap, Nepal

DDC. (2011). “Annual Plan of District Development Committee, 2011/12. District Development Committee, Sindhuli Nepal

DDC. (2011). “Annual Plan of District Development Committee, 2011/12. District Development Committee, Dolakha Nepal

DDC. (2011). “Annual Plan of District Development Committee, 2011/12. District Development Committee, Kavre Nepal

Department of Cooperative. (2013). <http://www.deoc.gov.np/ne/content.php?id=72> (As on October 17, 2013).

Department of Livestock Service. (2013). Annual Progress Report, 2011/12. Department of Livestock Service, Lalitpur, Nepal

DLSO Dolakha. (2012). Annual Progress Report of DLSO, Dolakha 2011/12. District Livestock Service Office, Dolakha

DLSO Kavre. (2012). Annual Progress Report of DLSO, Kavre 2011/12. . District Livestock Service Office,, Kavre

DLSO Ramechhap. (2012). Annual Progress Report of DLSO, Ramechhap 2011/12. District Livestock Service Office,, Ramechhap

DLSO. (2010). “Annual Livestock Development Programme 2009/10”, District Agriculture Development Office. Sindhuli, Nepal

DLSO. (2010). “Annual Livestock Programme and Statistical Book 2009/10”, District Agriculture Development Office. Ramechhap, Nepal

DLSO. (2010). “Annual Livestock Programme and Statistical Book 2009/10” District Agriculture Development Office. Dolakha, Nepal

DLSO. (2010). “Annual Livestock Programme and Statistical Book 2009/10”, District Agriculture Development Office. Kavre Nepal

DoA (2002). “Market Development Programme for High Value Agriculture Crops/ Commodities in Nepal”, Department of Agriculture, Kathmandu Nepal CBS, 2004,

DoA, 2005, “District profile of Agriculture related NGOs, Agrovets and Resource Persons”, Department of Agriculture, Lalitpur

DoA, 2011, “A Study on Potentiality of Commercialization of Agriculture in Dhulikel-Bardibas Road Corridor (Sindhuli Road Corridor)”, Department of Agriculture, Lalitpur Nepal

DoA. (2002), “Market Development Program for High Value Crops/Commodities in Nepal”, Department of Agriculture, Kathmandu

DoA/NPQP, 2063, “Plant Quarantine Activities, Annual Book 2062/63”, Department of Agriculture / National Plant Quarantine Programme, Lalitpur Nepal

DoA/NPQP, 2007, “Plant Quarantine Activities, Annual Book 2006/07”, Department of Agriculture / National Plant Quarantine Programme, Lalitpur Nepal

DOC. (2011). Statistical Profile of Cooperatives in Nepal. Department of Cooperative (DOC), Kathmandu, Nepal

DOC. (2012). Statistical Profile of Cooperatives in Nepal. Department of Cooperative (DOC), Kathmandu, Nepal

DOI (2003), Souvenir, Department of Irrigation: Golden Jubilee-2003, Kathmandu: Department of Irrigation, Ministry of Water Resources.

Economic Survey, 2054/55 - 2061/62, 2007/08, Ministry of Finance, Singha Durbar, Kathmandu,

Nepal.

FAO/UNDP (2003). Nepal Policy and Strategies for Poverty Alleviation and Food Security, Bangkok: Food and Agriculture Organization of the United Nations/United Nations Development Programme.

Fertilizer Department. (2013). <http://fert.nic.in/page/fertilizers-accounts> (As on October 17, 2013). Ministry of Chemicals and Fertilizers, Government of India, India

GoN (2004). Policy Papers on Agriculture, Irrigation, Forestry, Poverty, Gender Mainstreaming, Rural Infrastructure, Hydropower. (draft for Discussion), NDF, 2004, Consultative Meeting, Kathmandu. (Internet download)

GoN. 2010. Nepal's Millennium Development Goals Progress Report, 2010. Government of Nepal (GoN) and United Nations Country Team of Nepal.

GoN/ MoWR (1992). Water Resource Act 1992, Kathmandu: Ministry of Water Resources.

GoN/ MoWR (1997) Irrigation Policy 1992 (The first amendment 1997), Kathmandu: Ministry of Water Resources.

GoN/ MoWR (2000). Irrigation Regulation, Kathmandu: Ministry of Water Resources.

GoN/ MoWR (2001). The Hydropower Development Policy 2001, Kathmandu: Ministry of Water Resources.

GoN/ADB/FINNIDA (1988). Master Plan for the Forestry Sector Nepal, Kathmandu: His Majesty's Government of Nepal/Asian Development Bank/Finnish International Development Agency.

GoN/MFSC(2000). The Revised Forest Sector Policy 2000. Kathmandu: Ministry of Forests and Soil Conservation.

GoN/MFSC(2003). Nepal Biodiversity Implementation Plan, Kathmandu: Ministry of Forests and Soil Conservation (mimeograph).

GoN/MFSC. (2003). Terai Arc Landscape. Draft Strategic Plan 2004 - 2014. Kathmandu: Ministry of Forests and Soil Conservation

GoN/MLD (2004) (2004 a), Working Procedures for Local Bodies NGOs Mobilisation 2004. (Nepali version), Ministry of Local Development.

GoN/MLD (2004) Local Infrastructure Development Policy 2004. (Nepali version). Ministry of Local Development.

GoN/MOAD (1999). Fertiliser Control Order, 1999. Kathmandu: MOAD.

GoN/MOAD (2001) "Implementation Status of APP during Ninth Plan" Monitoring and Evaluation Division, Singha Durbar, Kathmandu.

GoN/MOAD (2001a). The National Agriculture Research and Development Fund, Kathmandu: MOAD.

GoN/MOAD (2002) National Fertiliser Policy 2002. Kathmandu: MOAD.

GoN/MOAD (2004) National Agricultural Policy, 2004. Kathmandu: MOAD.

GoN/MOAD, (2008), “Collection of Agriculture related Policies, Acts, Regulations and Orders”

GoN/MOAD. (2003), “Statistical Information on Neplease Agriculture 2002/03”. Government of Nepal / Ministry of Agriculture Development, Kathmandu Nepal.

GoN/MOAD. (2004), “Statistical Information on Neplease Agriculture 2003/04”. Government of Nepal / Ministry of Agriculture Development, Kathmandu Nepal.

GoN/MOAD. (2005), “Statistical Information on Neplease Agriculture 2004/05”. Government of Nepal / Ministry of Agriculture Development, Kathmandu Nepal.

GoN/MOAD. (2006), “Statistical Information on Neplease Agriculture 2005/06”. Government of Nepal / Ministry of Agriculture Development, Kathmandu Nepal.

GoN/MOAD. (2007), “Statistical Information on Nepalese Agriculture 2006/07”. Government of Nepal / Ministry of Agriculture Development, Kathmandu Nepal.

GoN/MOAD. (2008), “Statistical Information on Nepalese Agriculture 2007/08”. Government of Nepal / Ministry of Agriculture Development, Kathmandu Nepal.

GoN/MOAD. (2009), “Statistical Information on Nepalese Agriculture 2008/09”. Government of Nepal / Ministry of Agriculture Development, Kathmandu Nepal.

GoN/MOAD. (2010), “Statistical Information on Nepalese Agriculture 2009/10”. Government of Nepal / Ministry of Agriculture Development, Kathmandu Nepal.

GoN/MOAD. (2011), “Statistical Information on Nepalese Agriculture 2010/11”. Government of Nepal / Ministry of Agriculture Development, Kathmandu Nepal.

GoN/MOAD. (2012), “Statistical Information on Nepalese Agriculture 2011/12”. Government of Nepal / Ministry of Agriculture Development, Kathmandu Nepal.

GoN/MOAD/ABPSD 1999/2000 to 2003/2004. Statistical Information on Nepalese Agriculture: Agri-Business Promotion & Statistics Division, Ministry of Agriculture Development, Kathmandu

GoN/MOAD/M&E Division/Fertiliser Unit. 1999. ‘Fertiliser Trade Liberalization in Nepal: Papers and Proceedings of the National Workshop on Fertiliser Marketing System and Related Government Policy in Nepal’. Kathmandu: Fertiliser Unit, MOAD.

GoN/MoF. 2011, “Economic Survey”, Government of Nepal, Ministry of Finance. Kathmandu Nepal

GoN/MoFALD (2013) Federal Affairs and Local Development Ministry Information Bulletin,(2013. Ministry of Federal Affairs and Local Development, Kathmandu.

GoN/MoLJP (1999) Local Self Government Regulations 2056 (1999). Kathmandu: Ministry of Law, Justice and Parliamentary Affairs.

HARP (2001) Process documentation. Outcome and impact evaluation workshop to review process, Kathmandu: Hill Agriculture Research Project.

HARP (2001a) Monitoring and Evaluation System: An Overview. Kathmandu: Hill Agriculture

Research Project.

HARP (2004) Proceedings of the 6th National Outreach Workshop held at NARC. Kathmandu: Hill Agriculture Research Project.

HRP (2001) Operating a Competitive Grant Fund- the HARP Experience in Nepal, Kathmandu: Hill Agriculture Research Project.

ICIMOD, CBS, SNV. 2003. "District of Nepal Indicators of Development update 2003". International Center for Integrated Mountain Development / Central Bureau of Statistics / SNV Nepal. Kathmandu Nepal

ICIMOD, CBS, SNV.2003. "Mapping Nepal Census Indicators 2001 and Trends". International Center for Integrated Mountain Development / Central Bureau of Statistics / SNV Nepal. Kathmandu Nepal

ILD Group, 2004, Nepal Agricultural Sector Stakeholder Coordination Workshop. Godawari Village Resort, November 6 - 8, 2004, Lalitpur, Nepal.

ISRC, (2007). "District Profile of Nepal 2007/08", Intensive Study and Research Center (ISRC). Kathmandu Nepal.

ISRC. (2013). District and VDC Profile of Nepal: Socio-economic Development Database of Nepal. Intensive Study and Research Center (ISRC), Kathmandu, Nepal

ITAD (2005). A Review of Research Impact, Responsiveness and Future Priorities in the Agriculture Sector in Nepal (Draft). Kathmandu: ITAD. ITAD Agricultural Research Review

JICA/MOAD, 2001, "Study on the agriculture marketing development project in the Kingdom of Nepal, Final Report" Japan International Cooperation Agency/ MOAD, Kathmandu

JICA/MOAD/M&Y Consultants Co. Ltd/KRI International Corp., 2009, "Final Report on Program Formulation Study for Agriculture and Rural Development in Sindhuli Road Corridor in Nepal" Japan International Cooperation Agency/ MOAD, Kathmandu

Joint GoN (2001) 'Decentralization in Nepal: Prospects and Challenges Findings and Recommendation of Joint GoN - Donor Review'.

MoAD/ADB, 1991," Master Plan for Horticulture Development", Ministry of Agriculture Kathmandu/Asian Development Bank Manila

MOAD (2001a). The National Agriculture Research and Development Fund, Kathmandu: MOAD.

MOAD (2002) National Fertilizer Policy 2002. MOAD, Kathmandu:

MOAD (2004) Ministry of Agriculture and Cooperative, 2004. National Agricultural Policy, 2004. Kathmandu: MOAD.

MOAD . (2012). Ministry of Agriculture Development, Annual Progress Report, 2011/12. Ministry of Agriculture Development, Singhadarbar, Kathmandu

MOAD, (2006). One Village One Product Program Implementation Working Procedure, 2006.

MOAD

MOAD, (2007), “Agricultural Marketing Information Bulletin (Various issues)”. MOAD, Kathmandu

MOAD, (2005). “Agriculture Marketing Information Bulletin (Special Issue – 2005)”, Ministry of Agriculture and Cooperatives. Kathmandu Nepal

MOAD, (2008). “Agriculture Marketing Information Bulletin (Special Issue – 2008)”, Ministry of Agriculture and Cooperatives. Kathmandu Nepal

MOAD, (2011). “Agriculture Marketing Information Bulletin (Special Issue – 2010)”, Ministry of Agriculture and Cooperatives. Kathmandu Nepal

MOAD. 2010. Annual Progress Report of Ministry of Agriculture and Cooperatives and associated Organizations. Ministry of Agriculture and Cooperatives, Kathmandu, Nepal

MOAD/DoC, (2011), “Statistical information of Nepalese cooperatives Institution “Ministry of Agriculture and Cooperatives / Department of Cooperatives. Kathmandu, Nepal

MOAD/M&E Division/ Fertilizer Unit. (1999). ‘Fertilizer Trade Liberalization in Nepal Papers and Proceedings of the National Workshop on Fertilizer Marketing System and Related Government Policy in Nepal’. Kathmandu: Fertiliser Unit, MOAD.

MoCPA. (2012). National Cooperative Policy, 2012. Ministry of Cooperative and Poverty Alleviation, Baneshwor, Kathmandu, Nepal

MoF.(2009), “Economic Survey FY 2008/09”, Ministry of Finance, Kathmandu

MOLJ (1999) Local Self Government Act – 1999. Kathmandu: Ministry of Law, Justice and Parliamentary Affairs.

MOWR (1992). Water Resource Act 1992, Kathmandu: Ministry of Water Resources.

NARC (2000) Proceeding of the first NARC- private sector consultation meeting- Planning Division, Khumaltar: Nepal Agricultural Research Council.

NARC (2002 a) Proceedings: 5th national workshop on livestock and fishery research in Nepal, Kathmandu: Nepal Agricultural Research Council.

NARC (2002), Proceeding of the 5th National Outreach research workshop 2002, Khumaltar: Outreach Division, Nepal Agricultural Research Council.

NARDF. (2013). Project Compilation Report, , June 2013. National Agriculture Research and Development Fund (NARDF) Nepal. NARDF, Kathmandu

NARDF. (2012). Project Compilation Report, June 2012. National Agriculture Research and Development Fund (NARDF) Nepal. NARDF, Kathmandu

NARMA (2004) Impact Evaluation of Selected Hill Research Programme Funded Projects: Main Report; Kathmandu: NARMA Consultancy Private Limited.

NARMA (2010) Integrated Landscape Planning Framework and Sustainable Financing Mechanism:

NARMA Consultancy Private Limited.

National Cooperative Development Board. (2013). <http://www.ncdb.org.np/about-ncdb/organizational-chart/> (As on October 17, 2013). National Cooperative Development Board, Nepal

National Tea and Coffee Development Board" Tea – A – Tea", Kathmandu, 2005.

NDDDB (2001), National Milk Marketing and Strategy Study, Harihar Bhawan: National Dairy Development Board 2001.

Nepal Agricultural Extension Strategy (NAES), 2006

NPC (1997a) High Value Crops and Associated Agri-business in APP Interim Plan. Kathmandu: National Planning Commission.

NPC (1998). The Ninth Plan 1997 - 2002, Kathmandu: National Planning Commission.

NPC (2003). Poverty Reduction Strategy Paper, 2002–2007 (The Tenth Plan), Kathmandu: National Planning Commission.

NPC (2004) Progress Report on Poverty Reduction. An Assessment of the Tenth Plan (PRSP Implementation), Kathmandu: National Planning Commission.

NPC and MLD (2002), A National Framework Document for Decentralized Governance and Capacity Building, Kathmandu: National Planning Commission and Ministry of Local Development.

NPC, (2001). Mid-Term Review of the Ninth Plan, Kathmandu: National Planning Commission.

NPC, 2007, "Three Year Interim Plan 2064/65 – 2066/67", National Planning Commission, Kathmandu.

NPC, 2011 (a). Three Years Interim Plan (2010/11-2012/13). National Planning Commission (NPC), Kathmandu, Nepal

NPC, 2011 (b). National Development Programme, 2011/12. National Planning Commission, Kathmandu, Nepal

NPC, SAPPROS and IFAD (2002), Nepal: A Study of Rural Hill Potentials and Service Delivery Systems – A Comparative Assessment of Alternative Institutional Arrangements with a Focus on the Hill and Mountain, Kathmandu: National Planning Commission, SAPPROS and The World Bank.

NPC. (2013). Annual Development Programme (2013/14). National Planning Commission, Kathmandu, Nepal

NRB. (2012). Banking and Financial Status, Mid July 2012 (Vol 58). Nepal Rastra Bank, Kathmandu, Nepal

NRB. (2013). Nepal Rastra Bank: Quarterly Economic Bulletin April-May, 2013: Vol 47 (3). Nepal Rastra Bank, Kathmandu

NRB. 2011. Nepal Rastra Bank Quarterly Economic Report, April 2011. Nepal Rastra Bank,

Kathmandu, Nepal

OPM, (2003), Nepal Fertilizer Use Study April 2003. A study funded by the UK Department for International Development (DFID). Kathmandu: Oxford Policy Management and MOAD.

SEAN (2005) A Report on Vegetable Seed Trade Survey, Kathmandu: Seed Enterprises Association of Nepal.

Shakya, G, AEC/FNCCI, 2007. One Village One Product (OVOP) News Corner, OVOP Secretariat.

Sthapit B. R. ,1983, "Soyabean Production in the Hills of Nepal", MSc Thesis, Reading University , UK.

Trade Promotion Center, 2004. A Glimpse of Nepal's Foreign Trade (Statistical Presentation), Pulchok, Lalitpur, 2004.

WECS, 2010. Energy Sector Synopsis Report, 2010. Water and Energy Commission Secretariat (WECS), Singhadurbar, Kathmandu, Nepal

WFP / FAO, 2007, "Food and Agriculture Markets in Nepal", World Food Programme / Food and Agriculture Organization. Kathmandu Nepal

World Bank, (2003b), Local Organizations in Nepal: A Five Sector Study of District and Sub-District Organizations, Draft Research Report. Volume 1: Study Report, Kathmandu: The World Bank.

World Bank, (2005), Equity and Development. World Development Report 2006. Washington: The World Bank

World Bank. 2011. World Development Indicators. The World Bank, Washington DC, United States of America. Accessed from <http://data.worldbank.org/indicator> on July, 2011

APPENDIXES
APPENDIX 1
OFFICIAL DOCUMENTS
APPENDIX 2
PROJECT DESCRIPTION SHEETS

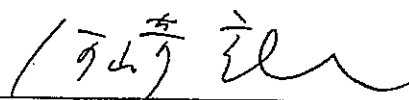
Appendix 1: Official Documents

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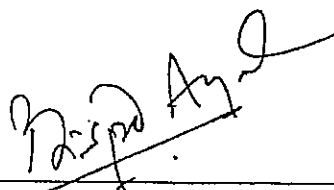
SCOPE OF WORK
FOR
HIGH VALUE AGRICULTURE EXTENTION AND PROMOTION PROJECT
IN SINDHULI ROAD CORRIDOR
IN NEPAL

AGREED UPON
BETWEEN
MINISTRY OF AGRICULTURE AND COOPERATIVES
AND
JAPAN INTERNATINAL COOPERATION AGENCY

Kathmandu, 14 February, 2011



Mr. Mitsuyoshi Kawasaki
Chief Representative
JICA Nepal Office
Japan International Cooperation Agency



Mr. Bishunu Prasad Aryal
Joint Secretary
Planning Division,
Ministry of Agriculture and Cooperatives
Government of Nepal

I. INTRODUCTION

In response to the official request of the Government of Nepal (hereinafter referred to as "GoN") in June 2009, the Government of Japan (hereinafter referred to as "GoJ") has decided, in accordance with the relevant laws and regulations in force in Japan, to conduct High Value Agriculture Extension and Promotion Project (hereinafter referred to as "the Study") within the framework of the Agreement on Technical Cooperation between GoJ and GoN signed on 3rd September, 2003 (hereinafter referred to as "the Agreement").

Accordingly, the Japan International Cooperation Agency (hereinafter referred to as "JICA"), the official agency responsible for the implementation of the GoJ's programs of Loan Aid, Grant Aid and Technical Cooperation, will jointly undertake the Study with the authorities concerned of the GoN.

The present document sets forth the Scope of Work with regard to the Study.

II. OBJECTIVES OF THE STUDY

The overall goal of the Study is to contribute to livelihood improvement of the rural people in Sindhuli Road Corridor through income generation by enhanced high value agricultural production.

The objectives of the Study are:

- (1) To formulate Master Plan (hereinafter referred to as "M/P") with the target year 2020, which consists of Action Plan (hereinafter referred to as "A/P") to promote high value agriculture of potential agricultural products in Sindhuli Road Corridor.
- (2) To transfer relevant skills and technologies to the Nepali counterpart personnel and beneficiaries through pilot activities and on-the-job training in the course of the Study.

III. STUDY AREA

Kavrepalanchowk, Dolakha, Ramechhap and Sindhuli Districts (Four Districts)

IV. SCOPE OF THE STUDY

In order to achieve the objectives above, the Study shall consist of the following items:



1. Phase 1: Basic Survey for M/P Preparation and Designing Basic Development Strategy

- 1-1. To overview the Government policies, programs and institutional arrangements to promote high value agriculture and corridor development in Nepal.
 - 1-1-1. Identification of institution and agencies related to agriculture development
 - 1-1-2. Highlight of government policies, strategies and program
 - 1-1-3. Review of budget and staff arrangement
- 1-2. To study the agriculture distribution, trade and market in Nepal.
 - 1-2-1. Overview of trade of agricultural products
 - 1-2-2. Condition of direction of trade and trade route
 - 1-2-3. Review of distribution of products and intermediaries
 - 1-2-4. Examination of mode of marketing and intermediaries
 - 1-2-5. Assessment of market facility
 - 1-2-6. Analysis of market and market/consumers' preference
- 1-3. To study the socio economic conditions of Sindhuli Road Corridor.
 - 1-3-1. Explanatory background of Sindhuli Road Corridor
 - 1-3-2. Feature of B. P. Koirala ("Sindhuli Road") and road network in road corridor
 - 1-3-3. Characteristics of caste/ethnic groups, disadvantaged group and conflict affected people
 - 1-3-4. Outline of industrial structure
 - 1-3-5. Highlight of labor force and employment opportunities
- 1-4. To overview agriculture in Sindhuli Road Corridor.
 - 1-4-1. Condition of climate, water resources and water use in agriculture
 - 1-4-2. Situation of land and asset holdings
 - 1-4-3. Examination of land use
 - 1-4-4. Analysis of agricultural production and market
 - 1-4-5. Review of agriculture extension
 - 1-4-6. Assessment of groups and cooperatives involved in agriculture
 - 1-4-7. Analysis of farm management
- 1-5. To analyze the situation of high value agriculture in Sindhuli Road Corridor and examine potential of such agriculture
 - 1-5-1. Condition of production of high value agricultural products
 - 1-5-2. Review of market, marketing and sales of high value agricultural products
 - 1-5-3. Condition and availability of technical support and availability
 - 1-5-4. Examination of private sector involvement

- 1-6. To clarify advantages of high value agriculture in Sindhuli Road Corridor (target area) and zone the target area according to the prospective development of each potential product with consideration of;
 - 1-6-1. Rationale of high value agriculture in overall farming situation
 - 1-6-2. Production volume, cost, sales and income
 - 1-6-3. Infrastructure
 - 1-6-4. Market, marketing and pricing
 - 1-6-5. Consumers and traders' preference
 - 1-6-6. Private sector involvement
 - 1-6-7. Identification of potential products
- 1-7. To draft a basic development strategy to enhance high value agriculture in Sindhuli Road Corridor toward the formulation of M/P.
- 1-8. To consider countermeasures to mitigate social and environmental impact based on the idea of strategic environmental assessment.
- 1-9. To conduct workshops among stakeholders for sharing the result from above mentioned 1.1-1.8 activities for their understanding.

2. Phase 2: Pilot Activities for M/P

- 2-1. To consider approach and design of pilot activities which verify the prospective development scenario and necessary action plan for each zone based on the basic development strategy. To prepare and implement the environmental and social management plan and mitigation measures, if the pilot plan is categorized "A" or "B" as per JICA guidelines for environmental and social considerations (April, 2004).
- 2-2. To Implement pilot activities based on 2-1 (not more than 10 (ten) sites). Following aspects are assumed to be incorporated in designing pilot activities.
 - 2-2-1. Strengthening of farmers group/cooperatives
 - 2-2-2. Promotion of production/Post harvest technologies development
 - 2-2-3. Promotion of Market/Marketing development
 - 2-2-4. Promotion of Small scale infrastructure development

3. Phase 3: Formulation of M/P

- 3-1. To review the result of pilot activities for M/P formulation.
- 3-2. To revise the basic development strategy.
- 3-3. To formulate M/P with target year 2020 for promotion of high value agriculture in Sindhuli Road Corridor including;
 - 3-3-1. Basic development strategy
 - 3-3-2. Policy design matrix including project long list with their priority
 - 3-3-3. A/P for priority projects in the project long list

①

6. ✓

V. STUDY SCHEDULE

The Study will be carried out in accordance with the tentative schedule in ANNEX.

VI. REPORTS

JICA shall prepare and submit the following reports in English to GoN.

- (1) Inception Report: Fifty (50) copies at the commencement of the Study
- (2) Progress Report 1: Forty (40) copies at the end of Phase 1
- (3) Progress Report 2: Forty (40) copies at the beginning of Phase 2
- (4) Interim Report: Forty (40) copies at the middle of the Study
- (5) Draft Final Report: Fifty (50) copies at the end of the field work; GoN will provide JICA with its comments on the Draft Final Report within one (1) month of the receipt of the Draft Final Report.
- (6) Final Report: Fifty (50) copies within two (2) months of the receipt of GoN's comments on the Draft Final Report

VII. UNDERTAKING OF THE GON

1. To facilitate smooth conduct of the Study, GoN shall take necessary measures:
2. GoN shall bear claims, if any arise, against the members of the Study Team resulting from, occurring in the course of, or otherwise connected with, the discharge of their duties in the implementation of the Study, except when such claims arise from gross negligence or willful misconduct on the part of the Study Team.
3. GoN shall be responsible for the security and safety of the Study Team and relevant information.
4. The Ministry of Agriculture and Cooperatives, at its own expense, where necessary, provide the Study Team with the following, in cooperation with other organizations concerned:
 - (1) Information as well as assistance in obtaining medical service;
 - (2) Available data (including maps and photographs) and information related to the Study;
 - (3) Counterpart personnel;
 - (4) Travel and daily allowances for counterpart personnel;
 - (5) Suitable office space with furniture and communication facilities;
 - (6) Necessary counterpart government budget for the Study operation; and
 - (7) Credentials or identification cards.

⑨

G.C. ✓

VIII. UNDERTAKING OF JICA

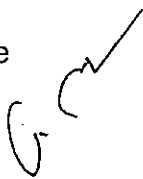
For the implementation of the Study, JICA shall take the following measures:

1. To dispatch, at its own expense, the Study Team to Nepal
2. To pursue technology and skills transfer to Nepali counterpart personnel as well as the communities in the course of the Study.
3. To make sure technology transfer to the counterparts.

IX. CONSULTATION

The Ministry of Agriculture and Cooperatives and JICA shall consult mutually in respect of any matter that may arise from or in connection with the Study.

ANNEX: Tentative Study Schedule



ANNEX: Tentative Study Schedule

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36						
Phase	Phase 1												Phase 2												Phase 3																	
Work in Nepal	■			■			■			■			■			■			■			■			■			■			■			■			■			■		
Work in Japan	□			□			□			□			□			□			□			□			□			□			□			□			□			□		
Report	△ IC/R			△ P/R-1			△ P/R-2			△ IT/R			△ D/F			△ F/R																										

Note: IC/R = Inception Report; P/R = Progress Report; IT/R = Interim Report; DF/R = Draft Final Report; F/R = Final Report

Amendment of Scope of Works

for

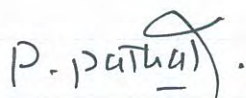
The Project for the Master Plan Study on
High Value Agriculture Extension and Promotion In
Sindhuli Road Corridor

In Nepal

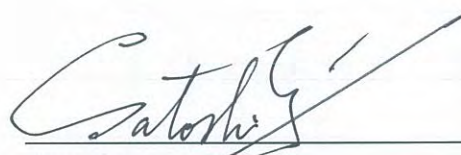
Agreed upon Between

The Ministry of Agriculture and Cooperatives
And the Japan international Cooperation Agency

Kathmandu, May 2012



Dr. Prabhakar PATHAK
Joint Secretary
Ministry of Agriculture Development



Mr. Satoshi FUJII
Senior Representative
JICA Nepal office



With reference to the project "The Project for Master Plan Study on High Value Agriculture Extension and Promotion in Sindhuli Road corridor in Nepal, both sides have agreed to make amendment on the Scope of Works dated February 14, 2011.

VII. UNDERTAKING of the GON

5. Government of Nepal shall provide necessary official visa to the study team for the whole study period.

VIII. UNDERTAKING of JICA

4. To dispatch the Study Team composed of these following disciplines.

- (1) Team Leader/Regional Development
- (2) Deputy Team Leader/ Regional Development
- (3) Agriculture Product Processing and Distribution Expert
- (4) Horticulture and Extension Expert
- (5) Farmers' Organization, Environmental and Social Consideration/Pilot Project Management Coordinator
- (6) Livestock and Extension Expert

P-12/12/11
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Minutes of Steering Committee Meeting

on

Inception Report

for

The Project for the Master Plan Study on High Value Agriculture Extension
and Promotion in Sindhuli Road Corridor in Nepal

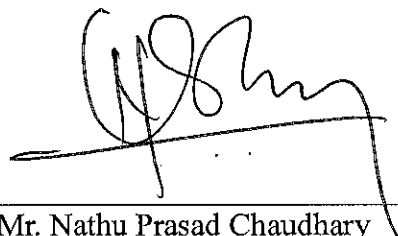
agreed upon between

Government of Nepal

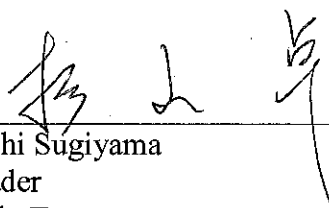
and

Japan International Cooperation Agency

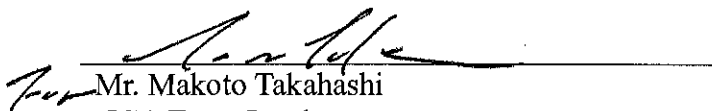
Kathmandu, 20, June , 2011



Mr. Nathu Prasad Chaudhary
Secretary,
Ministry of Agriculture and Cooperatives



Mr. Takashi Sugiyama
Team Leader
JICA Study Team
KRI International Corp.



Mr. Makoto Takahashi
JICA Team Leader
Director, Paddy Field Based Farming area
Division 2
Japan International Cooperation Agency

I. INTRODUCTION

With respect to The Project for the Master Plan Study on High Value Agriculture Extension and Promotion in Sindhuli Road Corridor in Nepal (hereinafter referred to as “the Study”), a Japan International Cooperation Agency (hereinafter referred to as “JICA”) Study Team with representatives from JICA Headquarters and Nepal office (hereinafter referred to as “the JICA Team”) had discussions with representatives of Ministry of Agriculture and Cooperatives (herein referred to as “MOAC”) and concerned Ministries at the Steering Committee on June 15th 2011 at the premises of MOAC,. The list of attendants of the Steering Committee is attached as Annex 1.

The followings are the subjects discussed and agreed upon between the Nepali side and Japanese side in the meeting.

II. RESULTS OF DISCUSSION

1. Acceptance of the Draft Inception Report

The JICA Team presented an Inception Report of the Study and submitted thirty (30) copies of the report to the Nepali side. The Nepali side accepted the Draft Inception Report and agreed with the Study purpose, activities, and schedule with their suggestions.

2. Establishment of Steering committee

Following the previous Minutes of the Meetings (hereinafter referred to as “M/M”) on Scope of Work(S/W) dated on 4th July 2010, both sides agreed to establish a Steering Committee as follows,

(1) The Steering Committee is comprised of the following members,

a) Chairperson

Secretary, MOAC

b) Member Secretary

Joint Secretary, Planning Division, MOAC

c) Members

Joint Secretary, Foreign Aid Co-ordination Division, Ministry of Finance
Joint Secretary, Agriculture and Rural Infrastructure Development Division, NPC (National Planning Committee)

Joint Secretary, Monitoring and Evaluation Division, MOAC

Joint Secretary, Gender Equity and Environment Division, MOAC

Joint Secretary, Agribusiness Promotion and Statistics Division, MOAC

Joint Secretary, Administration Division, MOAC

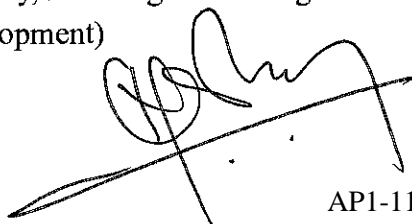
Director General, DOA (Department of Agriculture)

Director General, DOLS (Department of Livestock Services)

Director General, DOC (Department of Cooperatives)

Director General, DFTQC (Department of Food Technology and Quality Control)

Joint Secretary, Planning and Foreign Aid Coordination Division, MOLD (Ministry of Local Development)



Chief Executive Officer, AEC (Agro Enterprise Center), FNCCI (Federation of Nepalese Chambers of Commerce & Industry)
Representative, EOJ (Embassy of Japan)
Representative, JICA Nepal Office
Advisory Study Members from JICA HQs
Representative, the Study Team

* Chairperson can invite other members as needed.

** Committees in District level will be organized upon necessity after commencement of the Study.

*** Member Secretary will coordinate the committee.

(2) The Steering Committee shall be held periodically (i.e. the times the Progress Report are submitted) to share the progress and to discuss and decide the direction of the Study.

3. Establishment of Project Management Unit, Project Coordination Unit and Working Groups

For the smooth and successful implementation of the Study, both sides agreed to establish a Project Management Unit (hereinafter referred to as "PMU") The TORs of PMU are to be overall management of for the Study from all technical aspects and policy clarification, through joint works on the subject and output delivery in a course of the Study. PMU further works as a platform, which provides managerial supports to the JICA Study Team through regular and daily communications and coordination with stakeholders for facilitating the smooth implementation of the Study.

Also, both sides agreed to consider the establishment of district level Working Groups to implement the Study in cooperation with Project Management Unit and Project Coordination Unit. The expected WGs members are DADO, DLSO, and LDO under DDC level; this composition might be reviewed and revised on actual demand bases.

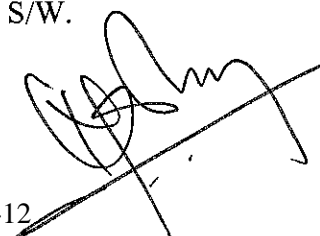
These Management Structure including the Steering Committee, Project Management Unit and Working Groups is attached as Annex 2.

4. Assignment of Counterpart Personnel

Based upon the S/W dated on 14 Feb, 2011, MOAC promised of assigning appropriate number of qualified counterpart personnel for aiming of technical transfer during a course of the Study. The JICA Team requested and MOAC agreed that the counterpart personnel shall not be changed and transferred during the Study period.

5. Necessary Equipment and Facilities for JICA Study Team

The Nepali side promised that office space, furniture and other equipment in central and district level shall be provided as set forth in the S/W.



6. Training in Japan

The JICA Team expressed that training in Japan would be held in the middle or late September in FY 2011.

7. Report

MOAC agreed that the Final Report of the Project shall be made available for the stakeholders and open to the public in order to make maximum use of the result of the Project.

8. Pilot Project

Both sides agreed that the purpose and importance of pilot projects. Lessons learned from the pilot projects shall be fed into the M/P in order to more practical and reliable. Also, those pilot projects are expected to play roles of consensus building among various stakeholders and giving preparatory opportunities for prioritized projects' materialization which would be proposed and recommended in the M/P.

9. Project Title

With regard to the contents of the Study, both sides agreed to modify the project name as follows;

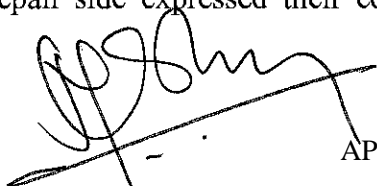
<Before>

High Value Agriculture Extension and Promotion Project in Sindhuli Road Corridor in Nepal

<After> The Project for the Master Plan Study on High Value Agriculture Extension and Promotion in Sindhuli Road Corridor in Nepal

10. Other Issues and Points discussed at St/C

- 1) The clarification of the joint project management structure with Nepali side and the JICA Study Team is required.
- 2) With respect to promotion of commercial agriculture and sustainability, the involvement of private sector is needed. Considering it, the Study should be conducted in collaboration with other similar projects as follows; OVOP projects implemented by Agro Enterprise Centre (AEC), technical wing of FNCCI (Federation of Nepalese Chambers of Commerce and Industries) Project for Agricultural Commercialization and Trade (PACT) by World Bank, Commercial Agriculture Development Project (CADP) by Asian Development Bank, etc.
- 3) The Nepali side expressed the facilitation of the export in the area of food safety and sanitation (Sanitary and Phytosanitary) to be included in the Study.
- 4) With respect to the implementation of the projects to be proposed in M/P, the tentative project cost, fund flow mechanism, implementation plan, project size, implementation modality and auditing procedures shall be clarified.
- 5) The alignment with the next agricultural development strategy (ADS), which is currently under preparation process in MOAC, shall be considered in the Study.
- 6) The Nepali side expressed their concern about the need for piloting or not and



AP1-13



shorten the study period, if possible.

- 7) With respect to the alignment of APP (Agriculture Perspective Plan) and several JICA projects so far, both side reconfirmed the importance and the necessity of the Study.

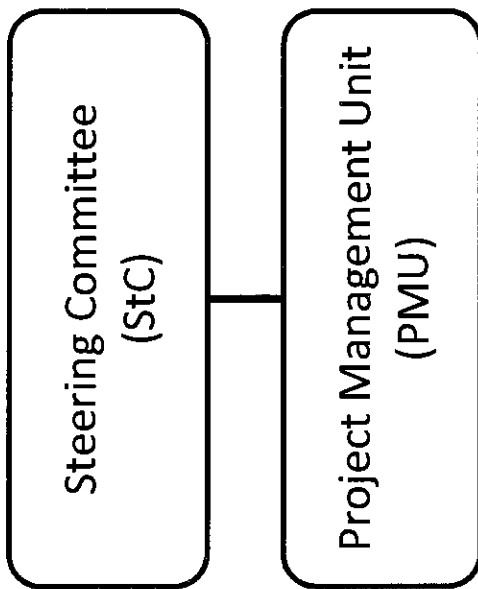
ANNEX 1: List of Attendants at the Steering Committee

ANNEX 2: Project Management Structure (tentative)

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Proposed Project Management Structure

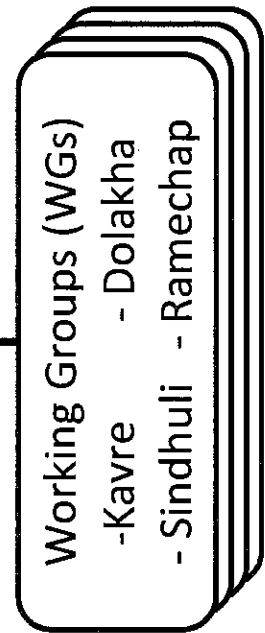
< Central Level >



Chair: Secretary of MOAC
Members: As listed in M/M
Function: Periodical progress monitoring and decision making on the directions of the Study

Project Manager: Regional Director of DOA, MOAC
Staff Member(s): 1 or 2 full time officer(s)
Technical Members: Working level staffs from concerned Divisions/Directorates under MOAC
Function: Provides regular managerial supports to JICA Study Team (JST) through coordination and facilitates technical inputs through joint work between MOAC and JST.

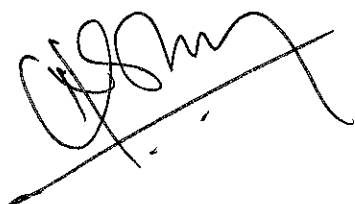
< District Level >



Head: To be advised (e.g. Head of DADO)
Members: To be advised (e.g. DADO, DSL, LDO, etc.)
Function: Provides District level coordination to facilitate the smooth implementation of the Study

Mr. Takeo Morita
Ms Mika Matsumura
Ms Shinko Koshiba

JICA Study Team
JICA Study Team
JICA Study Team

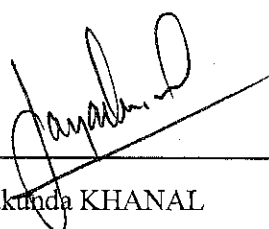
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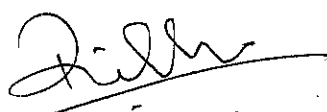
Handwritten initials 'AA' in black ink.Handwritten initials 'AK' inside a circle, in black ink.

Minutes of the Second Steering Committee
For
The Project for the Master Plan Study on High Value Agriculture Extension
and Promotion in Sindhuli Road Corridor in Nepal
agreed upon between
Government of Nepal
and
Japan International Cooperation Agency Study Team

Kathmandu, February 2013



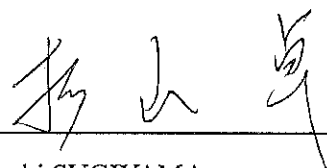
Mr. Jaya Mukunda KHANAL
Secretary
Ministry of Agriculture Development



Mr. Dilli Ram SHARMA
Regional Director
Central Regional Directorate of Agriculture
Ministry of Agriculture Development



Mr. Tomohiro ARIMA
Representative
JICA Nepal Office



Mr. Takashi SUGIYAMA
Team Leader
SRCAMP

I. Introduction

With respect to The Project for the Master Plan Study on High Value Agriculture Extension and Promotion in Sindhuli Road Corridor (hereafter referred as to “the Study”), a Japan International Cooperation Agency Study Team (hereafter referred as to “the JICA Team”) with representatives from JICA Nepal office (hereafter referred as to “JICA”) had discussion with representatives from Ministry of Agricultural Development (hereafter referred as to “MOAD”) and concerned Ministries at the Steering Committee on February 21st 2013 at the premise of MOAD on contents of Interim Report submitted in December. Both sides agreed the contents of the Interim Report. Annex1 shows the list of attendants.

The following is the subjects and contents discussed at the Meeting.

II. Discussion

1. Report on the Progress of the Study by the JICA Team

Takashi SUGIYAMA, team leader of the JICA Team, made a presentation on the progress and future plans as well as constraints encountered in the Study.

2. Main comments and questions from the Nepal side on the presentation.

- (1) It would be beneficial for research centers to be supported in the pilot project.
- (2) Along with the weak linkage between producers and traders, other constraints in the Nepal agriculture, including lack of knowledge, lack of infrastructure, etc., should be considered in the Study.
- (3) In addition to the producers and traders, other actors in the value chain should be well paid attention to.
- (4) Supply chain analysis should be included in the value chain study.
- (5) What are the countermeasures for unavailability of fertilizer?
- (6) Policy matters should be analyzed and included in the Study.
- (7) Lack of market information system (MIS) is not a problem: FNCCI, in cooperation with the Nepal government, has established a MIS, and it can be checked by phone or internet.
- (8) FNCCI hopes to collaborate with the Study in the Junar processing factory which is currently under construction.
- (9) In implementation of the pilot project, unique “Japanese-working-style” should be incorporated, and the field could learn from this extra value.

- (10) Has the cooperation in the period of 2014-2020 been already planned? If so, we would like to know how large it is going to be financially.
- (11) The government is currently working on Agriculture Development Strategy (ADS). Input, especially long-term strategy, from SRCAMP would be beneficial.
- (12) Some of the problems in Nepal agriculture, both in horticulture and livestock, are lack of standard for produce quality, safety and processing. These should be incorporated in the Study as constraints.
- (13) Value addition by processing should be included and considered in the Study.

3. Response from the Study Team

Takashi SUGIYAMA responded and clarified Nepal side comments and questions.

III. Results of Discussion

1. The Nepali side congratulated on smooth implementation of the Study.
2. Both sides expect that farmers of Sindhuli road corridor will be benefitted from the completion of the road.
3. The Nepali side showed interest in expanding the project.
4. The Nepali side, especially the secretary of MOAD requested focal counterpart, DOA, and DLS to involve in the project more intensively.
5. The Nepali side expects the JICA Team to promote using manure instead of chemical fertilizer in consideration of shortage of fertilizer in Nepal.
6. The Nepali side expressed its willingness to support the JICA Team as necessary.
7. Both sides agree to focus on rather the dissemination of existing technology in Nepal than the introduction of new technology, since certain agriculture technologies are already introduced in Nepal.
8. Both sides decided to drop L-1 in livestock pilot project due to concerns about side effects and health hazard.
9. Both sides agree that the JICA Team would take into account the introduction of quality control system into the master plan.
10. The JICA Team requested more active involvement of counterpart at both central and district level.
11. The JICA Team indicated the consideration of the post-SRCAMP projects although the details of the projects are under discussion.
12. The JICA Team focuses more on quality of fresh vegetables and fruits than on value addition and processing.
13. The JICA Team thinks that the improvement of production side is an issue, rather than

the development of distribution and marketing in livestock sector.

14. Both sides recognize shortage of fertilizer as one of the serious issues in agriculture sector in Nepal.

End.

Annex: 1 List of Attendances

1. Mr. Jaya Mukunda Khanal Secretary, Ministry of Agriculture Development
2. Dr. Prabhakar Pathak Joint Secretary, MoAD
3. Mr. Geha Nath Bhandari Joint Secretary, MoAD
4. Mr. Uttam K. Bhattarai Joint Secretary, MoAD
5. Mr. Kailash R. Pokharel Under Secretary, Ministry of Finance
6. Mr. Lila Ram Poudel Director General, Department of Agriculture, MOAD
7. Dr. Nar B. Rajwar Director General, Department of Livestock Services, MOAD
8. Mr. Dilli Ram Sharma Regional Director, RAD Central, MOAD
9. Ms. Jiwan Prava Lama Director General, Dept. of Food Technology and Quality Control (DFTQC)
10. Mr. Pradip Maharjan Chief Executive Officer, AEC/FNCCI
11. Mr. Tomohiro, ARIMA Representative, JICA Nepal
12. Mr. Narendra K Gurung Chief Program Manager, JICA Nepal
13. Mr. Badri Nath Koirala Program Director, MPCS
14. Mr. Bishnu Pd. Ghimire Senior Agri. Economist, Dept. of Cooperative
15. Mr. Mahendra N. Poudel Senior Agri. Economist, MoAD
16. Mr. Ravi Kr. Dangol Agri. Economist, MoAD
17. Ms. Bindira Adhikari Agri. Economist, MoAD
18. Mr. Lal Kumar Shrestha Agri. Economist, MoAD
19. Mr. Binod K. Bhattarai Agriculture Extension Officer, RAD and Counterpart SRCAMP, MOAD
20. Dr. Suvash Shiwakoti Veterinary Officer, DLS and counterpart SRCAP, MOAD
21. Mr Takashi SUGIYAMA Team Leader, SRCAMP/JICA
22. Mr. Makoto ISHIZUKA Deputy Team Leader, SRCAMP/JICA
23. Ms. Miki MORIMITSU SRCAMP/JICA
24. Mr. Tateo MORITA SRCAMP/JICA
25. Mr. Yasunori KANDA SRCAMP/JICA
26. Ms. Koshiba SHINKO SRCAMP/JICA
27. Mr. Binod Das Gurung SRCAMP/JICA
28. Mr. Purushottam Giri SRCAMP/JICA
29. Dr. Ragab Kayastha Intern, KRI (SRCAMP/JICA)

Minutes of the Third Steering Committee

For

The Project for the Master Plan Study on High Value Agriculture Extension
and Promotion in Sindhuli Road Corridor in Nepal


agreed upon between

Government of Nepal

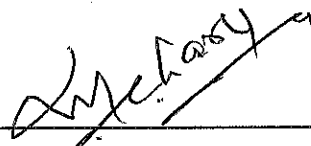
and

Japan International Cooperation Agency Study Team

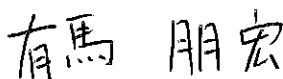
Kathmandu, 19th December 2013



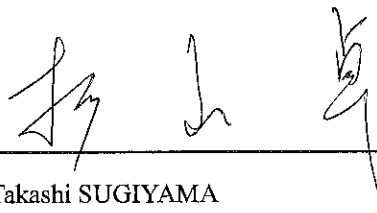
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Mr. Lekha Nath ACHARYA
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Representative
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Mr. Takashi SUGIYAMA
Team Leader
SRCAMP

I. Introduction

With respect to The Project for the Master Plan Study on High Value Agriculture Extension and Promotion in Sindhuli Road Corridor (hereafter referred as to “the Study”), a Japan International Cooperation Agency Study Team (hereafter referred as to “the JICA Team”) with representatives from JICA Nepal office (hereafter referred as to “JICA”) had discussion with representatives from Ministry of Agricultural Development (hereafter referred as to “MOAD”) and concerned Ministries at the Steering Committee on December 19th 2013 held at the premise of MOAD on contents of Draft Final Report. The list of attendants of the Steering Committee is attached as Annex1.

The following is the subjects discussed and agreed upon between the Nepali side and Japanese side in the meeting.

II. Discussion

1. Report on the Progress of the Study by the JICA Team

Takashi SUGIYAMA, team leader of the JICA Team, made a presentation on the Study progress based on Draft Final Report.

2. Main comments and questions from the Nepali side on the presentation.

- (1) Request for JICA to implement the project proposed by SRCAMP.
- (2) At least one project among newly proposed projects should cover a full range of value chain from production to marketing.
- (3) Draft Final Reports should be available to everyone in a way such as putting on website.
- (4) Further meeting is necessary to finalize the details of the projects such as activities and implementation modality.
- (5) Why were seedling and sapling not so much successful in the pilot projects?
- (6) Why will 3 projects, HO-1, HO-2 and LI-1 in prioritized projects with Technical Assistance (TA) last such a long time and be implemented in parallel?

3. Response from the Study Team

Takashi SUGIYAMA, team leader, and Tateo MORITA, horticulture expert of the JICA Team, appreciated the Nepal side for the comments and questions. Their answers to question (5) and (6) above were as follows.



- (5) It would take a substantial amount of time to see the impacts of seedling and sapling improvement activities (as for Junar sapling, about 3 years). The pilot projects for 15 months were thus not enough to observe these impacts. The activities for seedling and sapling improvements are included in the prioritized projects.
- (6) The list of new projects is just a proposal from the JICA Team. Government of Nepal or concerned authority can delete or implement any of them at their own will. The reason for proposing the implementation of HO-1, HO-2 and LI-1 in parallel is that they can work in synergy to raise the level of agricultural commercialization in targeted area rather than implementing them separately.

4. Main comments from the Japanese side on the presentation.

- (1) Draft Final Report is now in the hands of Government of Nepal.
- (2) JICA would like to materialize the results of SRCAMP.
- (3) There has already been a request submitted from Government of Nepal for the project one and half year ago and JICA would like to know the request status from Government of Nepal since it is still in pending.
- (4) It is only the Master Plan so, more importantly, Nepal and Japan should move ahead to implement the proposed projects.
- (5) Nepal has good potential for agricultural development. Government of Nepal should utilize this opportunity.

III. Results of Discussion

1. The Nepali side expressed their satisfaction for the work of the JICA Team.
2. Both the Nepali side and Japanese side expressed their willingness to sit together in another meeting to discuss about activities and implementation modality for the post-SRCAMP projects.
3. The JICA Team submitted 31 copies of the Draft Final Report to the Nepali side.
4. The Master Plan will be finalized during February and submitted in March 2014 after reflecting feedbacks from the Nepali side. Written comments will be accepted till the end of January 2014.



End.



Annex: 1 List of Attendants

1. **【Chair】** Dr. Prabhakar Pathak Officiating Secretary MoAD and Joint Secretary, Food Security and Environment Division, MoAD
2. Mr. Uttam K. Bhattarai Joint Secretary, MoAD
3. Dr. Rajendra Pd. Adhikari Joint Secretary, MoAD
4. **【Moderator】** Mr. Lekha Nath Acharya RD, CRAD and Focal Counterpart, SRCAMP
5. Mr. Harihar Kafle Agriculture Extension Officer, CRAD and Counterpart SRCAMP
6. Dr. Damodar Sedai RD, RDLS (Central Region)
7. Mr. Hasta Bahadur Bista Senior Agri-Economist, MoAD
8. Mr. Tara Kumar Shrestha Senior Agri-Economist, MoAD
9. Ms. Bishnu Devi Paudel Planning Officer, NPC
10. Mr. Mahendra Poudel Senior Agri-Economist, MoAD
11. Mr. Sheshmani Bhattarai Agriculture Extension Officer, CRAD
12. Mr. Prakash Kumar Sanjel Senior Planning Officer, CRAD
13. Mr. Binod Kumar Bhattarai Senior Agri-Economist, MoAD
14. Ms. Bindira Adhikari Agri Economist, MoAD
15. Mr. Lal Kumar Shrestha Agri Economist, MoAD
16. Dr. Hari Bahadur K.C. MoAD
17. Ms. Jiwan Prava Lama Director General, DFTQC
18. Mr. Birendra Bdr Hamal DDG, DOA
19. Mr. Bishnu Prasad Ghimire Senior Agri Economist
20. Mr. Sushil Khadka Agri Economist
21. Mr. Kikuo OHNO Embassy of Japan
22. Mr. B.K. Manandhar Embassy of Japan
23. Mr. Tomohiro ARIMA Representative, JICA Nepal Office
24. Mr. Narendra K. Gurung Chief Program Manager JICA Nepal
25. Mr. Takashi SUGIYAMA Team Leader, SRCAMP
26. Mr. M. ISHIZUKA Deputy Team Leader, SRCAMP
27. Mr. Tateo MORITA Horticulture Expert, SRCAMP
28. Mr. Yasunori KANDA Livestock Expert, SRCAMP
29. Ms. Mami YONEKAWA Farmer Organization/ Environment and Social Consideration, SRCAMP
30. Mr. Binod Das Gurung Project Coordinator, SRCAMP
31. Mr. Purushottam Giri SRCAMP

Lekha Nath Acharya



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HO-1: Sindhuli Road Corridor Commercial Agriculture Promotion (SRCCAP)

Project Number	HO-1
Project Title	Sindhuli Road Corridor Commercial Agriculture Promotion
Location	Accessible area from major road with potential of vegetable production in the 4 districts
Objectives	Agricultural income of the target farm households in the selected production pockets along Sindhuli Road Corridor is increased through agricultural commercialization.
Justification	<p>The project is formulated based on the following development potential in the SRC area for commercialization of agriculture:</p> <ol style="list-style-type: none"> 1) Rapidly growing demand for vegetables in the Kathmandu metropolitan area due to higher population increase and a change in food consumption pattern; 2) Contrarily, decreasing trend of vegetable production in suburban agriculture which currently supplies vegetables for the Kathmandu metropolitan area, due to rapid expansion of urbanization area; 3) High expectation for improvement of access from the SRC area to the Kathmandu valley after the completion of the Sindhuli Road; the farmers in SRC area will gain opportunities for more production and sale of vegetables for consumers in and around the Kathmandu metropolitan area. 4) Positive outcomes demonstrated in the SRCAMP pilot projects in terms of high performance of farmers for production of vegetables applying “unified standard production” technique and marketing of their products using the collection center through establishment of new relationship with traders; and 5) Comparative advantage of the SRC area to supply off-season vegetables for Terai, because the SRC area encompasses the various ago-ecological regions. <p>The project promotes agricultural commercialization in line with strategic direction of agriculture sector in hill/mountain areas of Nepal. The completion of the Sindhuli road enhances connectivity between the agricultural production pockets along Sindhuli road and Kathmandu metropolitan areas as well as Terai region. Taking advantage of this opportunity, the project aims to increase incomes of farm households located in agriculture production pockets of hill/mountain area along Sindhuli road by gradually shifting from subsistence farming to commercial farming, which is to say that the produced vegetables will be traded in the market. Eventually the increase in farmers’ incomes contributes to the improvement of the rural economy. The project, therefore, focuses on the establishment of linkage between production side and market side, which makes it easier to exchange production information in pocket areas and information of market demand (Demand-oriented Approach).</p>
Project Description	Under the project, the technical assistance is provided so as to promote the expansion of SRCAMP’s pilot approach for vegetable production and marketing. The expected outputs of the project are as follows:

	<p>Output-1: Farming system for producing marketable crops is established in producers groups.</p> <p>Output-2: Capability of private sector in farm inputs supply, provision of technical guidance for crop production and marketing services providing for the producer group is improved qualitatively and quantitatively.</p> <p>Output-3: Skills and capacity of the counterpart agency for implementation and coordination of projects conducted for agricultural commercialization promotion are improved.</p> <p>In order to achieve the above outputs, the following activities are necessary to be made:</p> <p>Activities for output-1:</p> <p>1-1 Select potential producer's groups</p> <p>1-2 Provide technical guidance of unified standard production system to the producer's groups</p> <p>1-3 Support the construction of collection centers, through cost sharing with the producer's group</p> <p>1-4 Support the smooth operation of the collection centers, with its development to become a hub for agricultural commercialization through multi-functional operation in mind</p> <p>1-5 Introduce sorting and packing system to improve transport efficiency</p> <p>1-6 Support to prepare cropping calendars corresponding to market information</p> <p>Activities for output-2:</p> <p>2-1 Introduce the collective purchasing system of production material</p> <p>2-2 Support to organize periodical farmer-trader meetings</p> <p>2-3 Provision of technical training for Agro-Vets</p> <p>2-4 Support to establish and operation of a platform for promotion of agricultural commercialization</p> <p>Activities for output-3:</p> <p>3-1 Assist C/P agency to coordinate with related agencies when implementing the project</p> <p>3-2 Support weekly site monitoring of producer's group activities conducted by JT/JTAs in DADO</p> <p>3-3 Support to organize monthly District Progress Review Committees (DPRCs) chaired by DADO</p> <p>3.4 Support to organize annual project progress and review committees at central level chaired by MOAD/CRAD with attendance of related officers and JT/JTAs in DADO</p>
Project Duration	5 years
Implementation Schedule	Preparatory works will be conducted in 2014 spending about 6 months. The project will be commenced in mid- 2014 and terminated in mid-2019.
Implementing agency	CRAD of DOA, MOAD and DADO

Indicative Project Cost	Rs. 582.7 million (USD 6.0 million) International consultants/experts are assumed to be hired for technical assistance which accounts for nearly 70% of the indicative cost.
Project Benefits	Incremental return of a beneficiary farmer who produces vegetables in one Ropani (500 sqm) open filed and 60 sqm plastic house is estimated to be Rs. 96,000 (USD 994). The total incremental return derived from 3,400 beneficiary farmers in the final project year of 2019 is thus calculated at Rs. 327.6 million (USD 3.38 million). Beside the incremental return of beneficiary farmers, Agro-Vets are expected to gain an additional income from an increase in sale of agricultural materials and farm inputs estimated to be Rs. 92.3 million (USD 953,000) during the project.
Stage of Project	Newly proposed

HO-2: Strengthening of Junar Production System

Project Number	HO-2
Project Title	Strengthening of Junar Production System
Location	Junar production area in Sindhuli and Ramechap districts
Objectives	Improved production system with proper countermeasure against greening disease is established for Junar.
Justification	<p>Junar is an acknowledged fruits commodity produced in the two districts. According to the statistics, in the two districts, Junar cultivation area is about 1,900 ha with 4,300 farmers producing 17,900 tons in 2011/12 season. Based on these figures, an average annual cultivation area and production per farmer are estimated to be 0.44 ha and 4.16 tons, respectively.</p> <p>Orchards are generally located at disadvantageous area. Their locations are on steep hill at far out from main roads. Local government is working enthusiastically for improvement to generate more income for farmers residing at those disadvantageous remote areas involving cooperatives and working with ODOP program. However, the condition at individual farm is still stay at low level. Lack of appropriate information is a cause to inhibit the improvement. The farmers have never calculated nutrient requirement to design fertilization plan, and never care about fertilizer design. They have applied whatever available at minimal quantity. Consequently, their production stays at low and unstable.</p> <p>In the pilot project which was designed based on the above findings, an advantageous effect of improved techniques for production of Junar was confirmed. Although harvesting work is still on-going and final results of production increase and quality improvement are not fully obtained as of the end of November 2013 (the harvest is scheduled to be completed in January 2014), pilot farmers and JT/JTA reported that there are significant differences between Junar trees with and without treatment of fertilizer application and pruning introduced by the pilot project.</p>
Project Description	<p>The proposed project is thus formulated to expand the improved techniques covering more Junar farmers by strengthening extension services. Under the project, the improved techniques will be introduced to 1,360 Junar farmers or about 32% of the total Junar farmers in the two districts.</p> <p>Improved techniques will be disseminated through cooperatives. Since the production areas are widely spread under different climatic and geographic condition, single design of treatment may not adoptable to all area, careful analysis for each treatment needs to be designed. Horticulturist specialized in orchard management will be included accompany with extension service. Selected farmers will be trained to become Field Facilitator to enhance the extension efficiency. Also local Agro-vets will be involved for smooth supply of farm materials and inputs. For efficient procurement of input materials, the producers' groups are trained.</p> <p>There is another critical issue in Junar production. Epidemic citrus greening disease has been identified within the area. Spread of this disease easily destroys the production area. Countermeasure against this problem must be included as a component of the project.</p>

	<p>Two screen houses for production of clean sapling is recommended to build in farmer plots with technical assistance for the nursery management. The screen houses are expected to implement experimental operation for establishing total management system of nursery for improved clean sapling production to distribute it to target farmers.</p> <p>The project aims to improve total system of Junar production from nursery to orchard. Clean sapling and improved orchard management expect to increase not only current production but also to alleviate the possible future damages from the critical disease.</p>
Project Duration	5 years
Implementation Schedule	2014 -2019
Implementing agency	DADO, DOA, CRAD, MOAD
Indicative Project Cost	Rs. 104.3 million (USD 1,076,000)
Project Benefits	<p><u>Number of beneficially in production improvement:</u></p> <p>The project supports Junar farmers by organizing producer groups. In the first year, 4 groups with 100 farmers will be supported. The number of groups and farmers will increase every year during the project, and a total of 55 groups with 1,360 farmers are planned to be covered by the project.</p> <p><u>Improvement in production:</u></p> <p>Traditional practice produces about 200 kg per optimal tree (8-10 years old in good condition). Pilot treatment improved the production to about 350 kg for same optimal tree. Production is expected to increase about 70% by implementation of the practice. Average of 15 trees per farmer is designed to treat by the project. However, there is limited number of optimal trees, so the actual increase per tree is less than the result observed in the pilot project. If the expected increase from the treatment is set at 50% of the optimal, increase of the annual production will be about 1,500 tons in the final project year of 2019. The sales value also expects to increase about Rs. 30, 000,000 also in the final project year of 2019. Recommended practice will improve quality as well as quantity; therefore, unit price is also expected to increase.</p> <p><u>Area of improved sapling distributed:</u></p> <p>Install two screen houses (200 sqm/house) will have a capacity to rare 8,000 saplings. If 50% survival rate is assumed, 4,000 saplings will be distributed each year from the experimental screen house, which will replace 20 ha of Junar orchard from traditional to virus free sapling.</p>
Stage of Project	Newly proposed

HO-3: Non Conventional Irrigation

Project Number	HO-3
Project Title	Non Conventional Irrigation
Location	Potential area based on water source availability in accessible area from major road with potential of vegetable production in the 4 districts
Objectives	<p>Expand the production capacity of competitive vegetables for dry season by alleviating irrigation water constrain.</p> <ul style="list-style-type: none"> • Install a cost efficient small scale irrigation system to supply irrigation water at potential area during dry season • Develop more appropriate technique for water efficient production in target vegetables • Extend the production season of vegetables which has a potential for competitive price
Justification	<p>Several areas in SRC have available water sources for dry season irrigation; however, the resources are not properly utilized. Trial installation of MWUS (multiple water utilization system) at Bocha site under the pilot project indicated positive economic effect for production of off-season vegetables. The production could be extended with investment in simple small scale irrigation system at those potential areas. Simple systems at reasonable cost which can be constructed with locally available technique and manageable by the local farmers have potentials to improve commercial production in those areas. Appropriate installation and utilization of the system will increase the production of vegetables at competitive price to improve farmers' income at those designated areas.</p>
Project Description	<p>The project aims to improve cash income by extending the production period of competitive vegetables at market. Non conventional irrigations such as gravity piped, water harvesting and small-scale pumped systems are generally expensive in unit cost per hectare basis. It is therefore proposed to support farmers by arranging matching fund system for the development. In this system, the beneficiary farmers are requested to organize themselves into a water user group and to defray 50% of the construction cost. Since high value commodities are produced using irrigation water, it is also proposed to implement the project with HO-1 (Sindhuli Road Corridor Commercial Agriculture Promotion) in order to ensure the synergies between the two projects. The project will be initiated from official announcement in which preparation of proposal for irrigation development are asked to farmers using a channel of ASC and VDC. After receiving the proposals, those will be evaluated by the project for selection of potential sites and farmer groups. The selected sites are investigated in terms of water availability particularly in dry season. All the construction related works, e.g., design of the system, selection of a contractor, construction supervision are carried out by national consultants under close coordination with DTO (District Technical Office) and DOLIDA. Guidance on smooth operation and maintenance of the system is also provided by the consultant at the initial stage of water use.</p>
Project Duration	2015-2018 (4 years)
Implementation Schedule	One cycle of project activities consisting the announcement, proposal evaluation, site investigation, site selection, selection

	of contractor, contract with contractor, construction supervision, operation and maintenance guidance needs about six months, and this cycle repeatedly implemented during the project. Accordingly, a total of six cycles can be implemented in four years.
Implementing agency	DADO, CRAD, DOA with DTO (District Technical Office) in DDC
Indicative Project Cost	Rs. 48 million (USD 495,000) assuming that 30 systems (90 ha) are constructed by hiring 60 person-days national consultant during the project.
Project Benefits	Incremental annual benefit derived from 90 ha of irrigated area is estimated to be Rs. 3,000 million (USD 31 million)
Stage of Project	Newly proposed

HO-4: Kurkot Logistics Center and Associated Distribution Network Improvement

Project Number	HO-4
Project Title	Kurkot Logistics Center and Associated Distribution Network Improvement
Location	<ul style="list-style-type: none"> • Kurkot, Sindhuli District, nearby the bridge across Sunkoshi River • Along the strategic roads (including Sindhuli Road) linking with Kurkot
Objectives	Improve the efficiency of distribution system of agricultural products originated from in/outside of the target area along the strategic roads, through establishing the transit/forwarding facility at Kurkot as well as the network of collection centers in strategic locations.
Justification	Full completion of both Sindhuli Road (BP Highway) and the bridge across Sunkoshi river at Kurkot expected during 2015 will provide the favorable conditions for the shipment/distribution of agricultural products in the study area. Because of the Kurkot's strategic location at the crossroad of four directions (China - India borders for North-South axis and Eastern Nepal - Kathmandu for East-West axis) connecting major consumption markets and emerging production areas, it has the high potential to grow as an important transit/forwarding point. By establishing the efficient distribution system of the agricultural products covering the main strategic roads including the Kurkot as the focal point, substantial social and economic impacts in large area and for populace can be expected.
Project Description	<p>Establishment of a logistics center with multiple functions (e.g. collection, storage in room or cold temperature, grading, packaging, forwarding etc.) which is possibly combined with other service functions such as agro-inputs and extension at Kurkot linked with a network of collection centers strategically located along the major roads.</p> <p>The project components are:</p> <ol style="list-style-type: none"> 1) Feasibility study with strategic planning of the efficient distribution network; 2) Design and construction of the facilities including Kurkot logistics center and associated collection centers linked with network; and 3) Establish the efficient management system to operate the network as a whole.
Project Duration	4 years
Implementation Schedule	2015-2018
Implementing agency	Directorate of Agri-business Promotion and Market Development, MOAD
Indicative Project Cost	Rs. 198 million (USD 2.05 million)
Project Benefits	Substantial positive social and economic impacts in large area and for populace can be expected.
Stage of Project	Newly proposed

HO-5: New Vegetable Wholesale Market in Eastern Kathmandu (NVWM)

Project Number	HO-5
Project Title	New Vegetable Wholesale Market in Eastern Kathmandu (NVWM)
Location	Eastern part of Kathmandu metropolitan area; if no appropriate land is secured, alternative site shall be studied for the construction of NVWM.
Objectives	To improve agricultural marketing system in and around the Kathmandu valley through establishment of NVWM in Kathmandu metropolitan area
Justification	<p>The necessity of new vegetable wholesale market in the Kathmandu metropolitan area was recognized far ahead of time not only by GoN but also by all the market participants in the value chain mainly in the central region. There existed no wholesale market functioning as an integrated manner in the Kathmandu metropolitan area. GoN also considered that improvement in the agricultural marketing system was a key element for commercialization of agriculture. Due to the above situation, GoN conducted the Study on the Agricultural Marketing Development Project during 2000–2001 period under the assistance of JICA. The study prepared, in its phase 1, a master plan for agricultural marketing system development for the whole country. Then in the phase 2, action plans were formulated for the marketing system development in priority areas selected in the master plan. The construction of the New Vegetable Wholesale Market in Kathmandu (NVWM) was one of the action plans formulated in the Study. Unfortunately, this action plan has not been implemented, and the situation of agricultural marketing system remains the same with that in 2001 (rather becoming worse).</p> <p>At present, a wide variety of agricultural markets exists discursively in the Kathmandu metropolitan area, e.g., Kalimati Wholesale Market, New Baneshwor Market, Balaju Collection Center and Kabhresthali Collection Center. Under such circumstances, it is difficult to consolidate effective and efficient marketing system in which mass transportation, stable supply system and fair price formation mechanism can be introduced, and quality standards and complex transaction form can be improved.</p> <p>In order to solve these problems, the present function of wholesale markets in the Kathmandu metropolitan area should be consolidated into NVWM. In the case of the Kalimati Wholesale Market, its function should be shifted to a multipurpose urban-type retail market. Adequacy of present Kalimati market as the wholesale market is low due to its location at the center of the metropolitan area, and accordingly traffic of large-sized vehicles is controlled during daytime hours.</p>
Project Description	<p>The establishment of NVWM will be achieved through the following steps:</p> <ol style="list-style-type: none"> 1) In the first step, it is necessary to secure the land for NVWM. According to the JICA Study on the Agricultural Marketing Development Project (2001), the land size of about 3,300 square meters is needed for the construction of market hall for vegetables, market hall for fruits, administration office/training center, and other facilities like canteen, toilet, etc. Considering the high potential for production and marketing of vegetables and fruits in the

	<p>study districts after completion of the Shindhuli road, it is ideally to select the land in the eastern part of the Kathmandu metropolitan area. But an alternative site will be examined, if no appropriate land is secured in the eastern part.</p> <p>2) In the second step, the results of the 2001 study will be updated, as the basic design study, focusing on the construction and operation of NVWM. In this updating study, the scale of each marketing facility will be decided after making supply and demand study targeting major vegetables and fruits. An organizational structure of NVWM will be also decided for the effective and efficient operation and maintenance (O&M). The cost estimate for the land acquisition, construction works, and O&M will be studied and updated. In the 2001 study, the direct construction cost and annual operation cost were estimated at about USD 12 million and USD 76,300, respectively (no information is available for land acquisition cost).</p> <p>3) In the third step, the detailed design together with the final cost estimate will be carried out for all the proposed facilities. This step will possibly be combined with the second step so as to simplify the procedure. For making the updating study cum basic design and detailed design, the following experts will be required:</p> <ul style="list-style-type: none"> • Team Leader/Agricultural Market; 6 person-months • Vegetable and Fruit Market; 6 person-months • Farming Community/organization; 4 person-months • Post-harvest handling; 4 person-months • Facility Design/Cost Estimate; 10 person-months • Environment; 2 person-months • Project Evaluation; 3 person-months <p>Total; 35 person-months</p> <p>4) In the final step, the construction work will be carried out. Before the completion of the construction, the staff recruitment for the administration of NVWM and their training will be undertaken.</p>
Project Duration	3 years
Implementation Schedule	<ul style="list-style-type: none"> • One year for the reparatory works including the land acquisition and updating of 2001 study cum basic design study, • One year for detailed design study, and • One year for the construction work including staff recruitment and training.
Implementing agency	Ministry of Agricultural Development
Indicative Project Cost	The total cost for the relevant studies and construction works including supervision is estimated at preliminary level to be Rs. 155 million (USD 1.6 million) if international consultants are assigned. In this cost estimate, however, the land acquisition cost is not included.
Project Benefits	<p>All the participants in the value chain including farmers, local and central traders, wholesalers, retailers, and consumers will benefit from:</p> <ul style="list-style-type: none"> • City entry time restriction,

	<ul style="list-style-type: none"> • Reduced quantity loss (faster, better handling, packing, storage, etc.), • Time and cost savings from more efficient marketing system, • Reduced quantity loss, and • Quality loss reduction.
Stage of Project	New, but the development plan was formulated in 2001 under the assistance of JICA.

HO-6: Study for NTFPs Promotion

Project Number	HO-6
Project Title	Study for NTFPs Promotion
Location	The Study covers the four study districts giving priority to the non-accessible areas where the forest resources are predominant.
Objectives	To verify the potential of NTFPs promotion from resource endowments to marketability
Justification	<p>The Herbs and NTFPs Development policy (2004) envisions holistic development of NTFP sector for poverty reduction and biodiversity conservation in Nepal focusing on regeneration, reproduction, ex-situ conservation of NTFPs; local processing through private sector participation; business development services; inclusion of the disadvantaged groups and earning of foreign currency through the competitive development of NTFPs. The policy aims to maximize economic and environmental benefits by promoting the cultivation and domestication of herbs, their sustainable harvests from both wild and cultivation, processing of the products and their marketing. The long-term goal of the policy is to substantially contribute to Nepalese economy by conserving and preserving high value herbs and NTFPs and establish Nepal as an enormous source of herbs and NTFPs internationally by the year 2020.</p> <p>However, there is no NTFP specific development plan at the national level as well as in all the study districts. District Forest Office is primarily responsible for management of NTFPs including issuance of the permit and license for harvesting and transportation. Although all the District Forest Offices have prepared five year forest working scheme for the sustainable management of forests, it remains silent on sustainable management of NTFPs.</p> <p>Nevertheless, NTFPs including herbs are vendible commodities particularly for the farmers in the non-accessible areas where the forest resources are predominant. In the district level workshops held in the course of Phase 1 study of SRCAMP, the District Forest Officers identified a total of 35 NTFPs as traded products from the study districts. For the commercialization of NTFPs, however, there are several unclear points that should be studied.</p>
Project Description	<p>The scope of the Study will consist of the following items:</p> <ol style="list-style-type: none"> 1) To overview the government policies, programs and institutional arrangements to promote NTFPs 2) To study NTFPs distribution, trade and markets in Nepal 3) To study the agro-economic conditions in the study districts 4) To analyze the situation of NTFPs and examine potential of NTFPs 5) To identify and prioritize the most socially and economically competitive NTFPs 6) To formulate NTFPs promotion plan for each district for the next 10 years <p>The composition of an international study team with estimated inputs are as follows:</p> <ul style="list-style-type: none"> • Team leader/agro-economist; 10 person-months

	<ul style="list-style-type: none"> • NTFPs experts; 10 person-months • Market analysis expert; 8 person-months • Sociologist; 8 person-months • Pedologist/land use; 6 person-months <p>Total 42 person-months</p> <p>In addition, some national experts will be hired particularly for the GIS analysis for the selection of potential areas and surveyors for socio- and agro-economic conditions in the selected VDCs. The results of GIS analysis made in SRCAMP will be utilized effectively in the Study.</p>
Project Duration	1.5 years including preparatory period
Implementation Schedule	2015-2016
Implementing agency	Department of Plant Resources and Department of Forest under Ministry of Forest and Soil Conservation
Indicative Project Cost	Rs. 126 million (USD 1,300,000)
Project Benefits	Directions of NTFPs promotion in the respective study districts will be verified.
Stage of Project	Newly proposed

LI-1: Sindhuli Road Corridor Traditional Livestock Production Improvement (SRCTLPS)

Project Number	LI-1
Project Title	Sindhuli Road Corridor Traditional Livestock Production Improvement
Location	Accessible area from major road with potential of livestock production improvement within the 4 districts / 1,000 goat farmers and 1,000 dairy farmers by organize a total of 40 producers groups during the project
Objectives	Agricultural income of the target farm households in the selected production pockets along Sindhuli Road Corridor is increased through agricultural commercialization.
Justification	<p>The demand for milk is assumed to grow further from the increasing with population growth and advancement of urbanization of Kathmandu valley and local towns. The milk supply of neighboring county, India in 2009 is 43.6kg/capita/year which is 1.3 times higher than Nepal (FAOSTAT). There is a room for potential demand in milk, since the production never caught up with consumption in Nepal. Trend of goat meat production is increasing 3.5% at about same ratio as population growth (2002-2011, FAOSTAT). The price of goat meat is rapid rising annually averaged 15% during recent 5years (MOA). Therefore the demand for goat meat also is assumed to grow</p> <p>After completion of Sindhuli road in 2015, sales opportunity of livestock products also will be supposed to extend in order to improve distribution of agricultural products toward Kathmandu in targeted 4 districts. Farmers will be provided chance to transition from a self-sufficiency production to a commercial production. This will require the production techniques for livestock products meet market needs and knowledge of integrated farm management.</p> <p>This project aims to expand the techniques verified from pilot project about increasing milk yield of individual animal and increasing weight gain of goat and its economic efficiency through the improving technique for existing feeding. Besides the project makes earning rate of milk and goat increase due to reduce the feed costs that accounts for the majority of production cost by the execution of an increase the production of roughage adapted each project site which is very important feed for ruminant animals such as buffalo, cow and goat.</p> <p>In addition , the project support dairy cooperative organized by milk producers to improve milking and feeding techniques for production of good quality milk and increase techniques for test of milk quality because it is necessary to produce good standard milk for sale</p>
Project Description	<p>Under the project, the technical assistance is provided so as to promote the expansion of SRCAMP's pilot approach for milk and goat production. The expected outputs of the project are as follows:</p> <p>Output-1: Farming system for producing marketable livestock products is established in producers groups.</p> <p>Output-2: Capability of private sector in farm inputs supply, provision of technical guidance for dairy and goat production and marketing services providing for the producer group is improved qualitatively and quantitatively.</p>

	<p>Output-3: Skills and capacity of the counterpart agency for implementation and coordination of projects conducted for agricultural commercialization promotion are improved.</p> <p><u>Activities for Output-1:</u></p> <p>1-1. Select potential dairy and goat producer's groups</p> <p>1-2. Provide technical guidance of improved production system to the producer's groups</p> <p>1-3. Introduce quality control system to improve marketing efficiency</p> <p><u>Activities for Output-2:</u></p> <p>2-1. Introduce the collective purchasing system of production material</p> <p>2-2. Support to organize farmer-trader meeting/training</p> <p>2-3. Support to establish and operation of a platform for promotion of agricultural commercialization</p> <p><u>Activities for Output-3:</u></p> <p>3-1. Assist C/P agency to coordinate with related agencies including private sector when implementing the project</p> <p>3-2. Support weekly site monitoring of producer's group activities conducted by JT/JTAs in DLSO</p> <p>3-3. Support to organize monthly District Progress Review Committees (DPRCs) chaired by DLSO</p> <p>3-4. Support to organize annual project progress and review committees at central level chaired by MOAD/RDLS, Central with attendance of related officers and JT/JTAs in DLSO</p>
Project Duration	5 years
Implementation Schedule	Preparatory works will be conducted in 2014 spending about 6 months. The project will be commenced in mid-2014 and terminated in mid-2019.
Implementing agency	Department of Livestock Services (DLS), Regional Directorate of Livestock Services (RDLS), District Livestock Services Offices (DLSO), Dairy cooperatives
Indicative Project Cost	Rs. 156.4 million (USD 1.62 million)
Project Benefits	Tangible benefit in the final project year of 2019 is estimated to be Rs. 49,203,200 (USD 507,825) from a total of 2,000 beneficiary farmers in 40 sites. Based on this figure, per farm household incremental benefit is estimated at Rs. 24,600 (USD 254)/year.
Stage of Project	Newly proposed

LI-2: Genetic and Reproductive Improvement of Dairy Animals

Project Number	LI-2
Project Title	Genetic and Reproductive Improvement of Dairy Animals
Location	Areas where milk is collected for sales along the Sindhuli highway. It could be expanded as collection capability is increased. (for details, see Project Description part)
Objectives	To improve capability of dairy animals in order to increase milk production. In the long-run, the genetic improvement of dairy bulls will be attained.
Justification	It is improper to increase scale of operation under current condition in SRC area as there are serious constraints in labor, feed availability and land. Improving milk production volume per head is one realistic method that target farmers can take. Genetic and reproductive improvements are efficient program for this purpose in the area; however, these are not progressing because of the shortage of superior bulls (both buffalo and dairy cattle) and skilled AI technicians at VDC level.
Project Description	<p>The project aims to improve capability of dairy animals in order to increase milk production by;</p> <ul style="list-style-type: none"> • introducing elite buffalo bulls and/or artificial insemination (AI) to inherit their higher genetic ability in milk production • shortening calving intervals to improve lactation period <p>For introduction of elite bulls and AI to breed dairy animals of participated farmers, the project includes following activities; 1) distributing a few BGIP screening dropped out elite bull to each targeted VDC; 2) establishing a system to exchange bulls among VDCs to avoid inbreeding; 3) extending AI implementation to the target area (100 dairy animals per year per VDC); 4) training one or two local personnel per each VDC to become an AI technician (training includes techniques for pregnant diagnosis and castration, fertility assessment of bull); and 5) carrying out technical assistance, monitoring and record keeping by JT/JTA with local technician, 6) establishing the community-based bull selection method.</p> <p>Targeted project areas: 10 VDCs in Kavre district, 6 VDCs in Shindhuli district (both along the Sindhuli highway), 6 VDCs in Ramechhap district (along the paved road between Tamakhosi and Kurkot), and 8 VDCs in Dolakha district (along the Alaniko highway and the paved road between Charikot and Orang and Melung).</p> <p>Total target household : 3,000HH (average 100HH per VDC, 30 VDCs by 100HH)</p>
Project Duration	5 years
Implementation Schedule	2015 – 2019
Implementing agency	Department of Livestock Service, District Livestock Service Office(DLSO), Nepal Agricultural Research Council(NARC), Cooperative, Farmers group

Indicative Project Cost	Approx. 0.5 million USD (tentative), Recurrent cost shall be allocated by local currency
Project Benefits	After the 5 years of project implementation, 60 % of target dairy animals improve conception rate, 20 % will shorten the calving interval, and 30 % will shorten mating interval after calving. 1,800 improved dairy animals (female 900 heads, male 900 heads) will be produced. The total milk production of target dairy animals will be increased by more than 20%, and 30 to 60 community artificial inseminator will be increased.
Stage of Project	Newly proposed

LI-3: Genetic and Reproductive Improvement of Goats for Meat Production

Project Number	LI-3
Project Title	Genetic and Reproductive Improvement of Goats for Meat Production
Location	Goat pocket areas in 4 districts
Objectives	Improve meat productivity of goats by genetic improvement (daily weight gain and the kidding number (the number of kid goats that one female goat gives birth per year) by shortening kidding intervals)
Justification	Capacity of farmers for raring goats in the SRC area is constrained by both labor and facility; therefore, expanding their raring scale is not possible. Increasing individual goat's weight gain ability and shortening reproductive intervals are more feasible methods for efficient meat production in SRC area. Genetic and reproductive improvement in this program is recommended in the constrained mountain range.
Project Description	<p>This project tries to improve goat meat production by genetic and reproductive improvement by introduction of improved bucks and efficient reproductive management practice for introduced bucks to the community.</p> <p>The activities include; 1) distribution of 10 to20 improved bucks to each district, 2) establishment of a selection system of new born kid for better genetic inheritance, 3) establishment of buck exchange system among communities to avoid inbreeding, 4) introduction of flushing practice* 5) training of one or two local personnel per each VDC in castration techniques and an assessment of bucks, 6) technical assistance, monitoring and record keeping by JT/JTA with local technician.</p> <p>The target areas: 2 VDCs with livestock service center or sub-center each district per year.</p> <p>Beneficiaries: form one or two groups in each VDC (one group is average 25 HH), a total of 200 HH to 400HH per year</p> <p>*flushing practice: feeding treatment that could improve carrying twins</p>
Project Duration	5 years
Implementation Schedule	2015 - 2019
Implementing agency	Department of Livestock Service, District Livestock Service Office(DLSO), Cooperative, Lease Forest User Group, Farmers group
Indicative Project Cost	Approx. 0.5 million USD (tentative), Recurrent cost shall be allocated by local currency
Project Benefits	After the 5 years of project implementation, sales rate of goat of household will be improved, community based buck selection method and exchange system will be established, and 10 to 20 community technician each district will be trained.
Stage of Project	Newly proposed

LI-4: Improvement in Genetic Capability of Empty Dry Buffalos in the Trusted Breeding Farm (Pilot Project)

Project Number	LI-4
Project Title	Improvement in Genetic Capability of Empty Dry Buffalos in the Trusted Breeding Farm (Pilot Project)
Location	Milk pockets (Banepa, Panchikhal, Ramitor) of buffalo in Kavre district that have active daily cooperatives
Objectives	Improve milk productivity of buffalos by shortening the empty dry period.
Justification	Many genetically improved dairy buffalos with high lactation capacity are being slaughtered for meat because of difficulty in detecting their heat and long time until they become pregnant. The conception rate of these empty dry buffalos could be increased if they are mass reared with bulls in the trusted breeding farm for conception. Improved conception rate of empty dry dairy buffalos will reduce the culling of improved breed as well.
Project Description	This project will be implemented as a pilot. First, the project needs to identify the feasibility of the trusted system. The items to be considered are; an insurance system for disease and death, the management body and system, deposit fees, etc. The land for the breeding farm needs to be also secured (private or government, rented or bought-up). After identification of an appropriate trusted system, the breeding farm needs to be established. Other program activities includes; 1) establish one or two trusted breeding farm in Kavre district (capacity of farm: free stall barn for around 100 female buffalos, 1,500 square meters); 2) collect appropriate number of elite bulls (at least 3 bulls) for the start; 3) extend the trusted system for breeding to target farmers; 5) analyze conception rate, feasibility of the system and economic efficiency.
Project Duration	5 years
Implementation Schedule	2015.7 – 2016.1 Feasibility study 2016.2 – 2019.6 Implementation phase
Implementing agency	Kavre dairy cooperatives, Agro-vets (Private), DLSO Kavre
Indicative Project Cost	Approx. 0.2 million USD (tentative), Recurrent cost shall be allocated by local currency
Project Benefits	After the 5 years of project implementation, the trusted breeding farms will be established, disposal by sales of superior female buffalos will be reduced and genetic improvement of buffalos will be pushed ahead.
Stage of Project	Newly proposed

GO-1: Continuous Expansion of Agricultural Extension Services by DADO

Project Number	GO-1					
Project Title	Continuous expansion of agricultural extension services by DADO					
Location	Kavre, Dolakha, Ramechhap and Sindhuli districts					
Objectives	Agricultural development through provision of district extension services					
Justification	<p>DADO in each district plays an important role in agriculture development. Main objective of DADO is to raise the standard of living of the farmers through extension of improved technologies on various crops and thereby increasing agricultural productivity and income. It intends to transform traditional farming into a modern scientific practice by giving access on improved technologies, improved seeds, and chemical fertilizer to the farmers to increase crop productivity and create employment opportunities.</p> <p>Although there is a possibility of modification in Nepal's agricultural extension system as stated in draft ADS (February 2013), this description sheet has been prepared based on the existing system deployed by each DADO.</p>					
Project Description	<p>DADO will continue their services for agriculture development in the respective study districts. The top three priority projects/programs in 2013/14 fiscal year in each DADO in terms of budget amount are as follows:</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%; vertical-align: top;"> <p>Kavre Agriculture market development project Citrus and other fruits development Seed self sufficiency</p> </td> <td style="width: 50%; vertical-align: top;"> <p>Ramechhap Agriculture extension support service for poverty reduction Intensive crop production for food security Sustainable agriculture management for food security</p> </td> </tr> <tr> <td style="vertical-align: top;"> <p>Dolakha Agriculture extension support service for poverty reduction Plant protection and support services for food security Commercial vegetable production in off-season</p> </td> <td style="vertical-align: top;"> <p>Sindhuli Agriculture extension support service for poverty reduction Integrated plant and water management for food security Commercial vegetable production in off-season</p> </td> </tr> </table> <p>Note: The latest periodic district development plan (2001/02-2006/07) has already been expired, and no further periodic plan has been prepared due mainly to absence of the local elected bodies. Thus each district has been preparing only annual plan since 2007/08 without the periodic plan. Source: Each DADO, 2013/14 fiscal year</p> <p>In addition to the above agriculture extension projects/programs, different Directorates under DOA is providing direct financial support to the district for implementation of different agriculture related projects/programs. In the same manner, the top three priority projects/programs in 2013/14 fiscal year in each district are listed in the table below:</p>		<p>Kavre Agriculture market development project Citrus and other fruits development Seed self sufficiency</p>	<p>Ramechhap Agriculture extension support service for poverty reduction Intensive crop production for food security Sustainable agriculture management for food security</p>	<p>Dolakha Agriculture extension support service for poverty reduction Plant protection and support services for food security Commercial vegetable production in off-season</p>	<p>Sindhuli Agriculture extension support service for poverty reduction Integrated plant and water management for food security Commercial vegetable production in off-season</p>
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	<p>Kavre Potato and spices development program Sericulture development program Cooperative farming, small irrigation and cooperative development</p>	<p>Ramechhap Cooperative farming, small irrigation and cooperative development Potato and spices development program Soil testing and improvement program</p>																																																																																																		
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<p>Source: Nepal Development Program 2013/14, National Planning Commission</p> <p>DADO will also continue these projects/programs, although some modifications will be made following the progress of each development work. Aiming for synergy effect, it will be possible to combine the DADO's projects/programs with the ones proposed by SRCAMP. Each DADO and DDC is therefore proposed to monitor the progress of preparatory works of GON for the implementation of post-SRCAMP projects/programs.</p>																																																																																																				
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Indicative Project Cost	<p>According to the District Development Plan and Nepal Development Program of the National Planning Commission, the annual budgets for 2013/14 in the respective DADOs are as follows: (Unit: Rs. 1,000)</p> <table border="1"> <thead> <tr> <th rowspan="2"></th> <th colspan="2">Kavre</th> <th colspan="2">Dolakha</th> <th colspan="2">Ramechhap</th> <th colspan="2">Sindhuli</th> <th colspan="2">Total</th> </tr> <tr> <th>(Rs.'000)</th> <th>(%)</th> <th>(Rs.'000)</th> <th>(%)</th> <th>(Rs.'000)</th> <th>(%)</th> <th>(Rs.'000)</th> <th>(%)</th> <th>(Rs.'000)</th> <th>(%)</th> </tr> </thead> <tbody> <tr> <td>DADO's original budget</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>Projects/Programs</td> <td>12,713</td> <td>29.8</td> <td>14,640</td> <td>34.3</td> <td>5,770</td> <td>13.5</td> <td>9,546</td> <td>22.4</td> <td>42,669</td> <td>100.0</td> </tr> <tr> <td>Capital expenditure</td> <td>650</td> <td>3.2</td> <td>515</td> <td>2.6</td> <td>3,985</td> <td>20.0</td> <td>14,820</td> <td>74.2</td> <td>19,970</td> <td>100.0</td> </tr> <tr> <td>Administration and office operation</td> <td>12,943</td> <td>26.9</td> <td>10,000</td> <td>20.8</td> <td>12,936</td> <td>26.9</td> <td>12,167</td> <td>25.3</td> <td>48,046</td> <td>100.0</td> </tr> <tr> <td>Sub-total</td> <td>26,306</td> <td>23.8</td> <td>25,155</td> <td>22.7</td> <td>22,691</td> <td>20.5</td> <td>36,533</td> <td>33.0</td> <td>110,685</td> <td>100.0</td> </tr> <tr> <td>Provided by DOA's different Directorates</td> <td>53,635</td> <td>45.6</td> <td>25,933</td> <td>22.0</td> <td>12,285</td> <td>10.4</td> <td>25,784</td> <td>21.9</td> <td>117,637</td> <td>100.0</td> </tr> <tr> <td>Total</td> <td>79,941</td> <td>35.0</td> <td>51,088</td> <td>22.4</td> <td>34,976</td> <td>15.3</td> <td>62,317</td> <td>27.3</td> <td>228,322</td> <td>100.0</td> </tr> </tbody> </table> <p>Source: District Development Plan of the respective districts, and Nepal Development Program 2013/14, the National Planning Commission</p>			Kavre		Dolakha		Ramechhap		Sindhuli		Total		(Rs.'000)	(%)	(Rs.'000)	(%)	(Rs.'000)	(%)	(Rs.'000)	(%)	(Rs.'000)	(%)	DADO's original budget											Projects/Programs	12,713	29.8	14,640	34.3	5,770	13.5	9,546	22.4	42,669	100.0	Capital expenditure	650	3.2	515	2.6	3,985	20.0	14,820	74.2	19,970	100.0	Administration and office operation	12,943	26.9	10,000	20.8	12,936	26.9	12,167	25.3	48,046	100.0	Sub-total	26,306	23.8	25,155	22.7	22,691	20.5	36,533	33.0	110,685	100.0	Provided by DOA's different Directorates	53,635	45.6	25,933	22.0	12,285	10.4	25,784	21.9	117,637	100.0	Total	79,941	35.0	51,088	22.4	34,976	15.3	62,317	27.3	228,322	100.0
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	<p>The agricultural development budget (excluding the administration and office operation) per farm household (FHH) is estimated at Rs.888 on an average in the four districts based on the available data on annual budgets (Rs. 180 million in 2013/14) and the number of FHHs (202,600 in 2011) in four districts. GON is requested to increase the agriculture development budget for each district. Its minimum requirements shall be decided taking the annual growth rate of GDP in agriculture sector into account. According to the data from CBS, it was 4.51% p.a. in 2010/11 and 4.93% p.a. in 2011/12 including the forestry and fishery subsectors.</p>
Project Benefits	<ul style="list-style-type: none"> • Increase of agricultural productivity and income • Raise of the standard of living of the farmers, and • Creation of more employment opportunities.
Stage of Project	On-going

GO-2: Continuous Expansion of Agricultural Extension Services by DLSO

Project Number	GO-2							
Project Title	Continuous expansion of agricultural extension services by DLSO							
Location	Kavre, Dolakha, Ramechhap and Sindhuli districts							
Objectives	Livestock sector development through provision of district level extension services							
Justification	<p>The objective of DLSO is to increase national production of livestock products by diversifying and commercializing livestock activities in district and by making it income oriented and a respectable occupation. There is no comprehensive livestock development plan in all four districts similarly with the crop agriculture. Each district conducts participatory planning exercise at the service center/sub-service center to identify needs of different target groups. Based on this, annual plan of the livestock development is prepared for district livestock development program.</p> <p>Although there is a possibility of modification in Nepal's livestock agriculture extension system as stated in draft ADS (February 2013), this description sheet has been prepared based on the existing system deployed by each DLSO.</p>							
Project Description	<p>DLSO will continue their services for livestock development in the respective four districts. The top three priority projects/programs in 2011/12 fiscal year in each district in terms of budget amount are as follows:</p> <table border="1"> <tr> <td> <p>Kavre Partnership program for a livestock facility development Commercial livestock development and extension Livestock health program</p> </td> <td> <p>Ramechhap Awareness building and sensitization related program Livestock laboratory and vaccination program Livestock feed and pasture development</p> </td> </tr> <tr> <td> <p>Dolakha Livestock health program Livestock feed and pasture development Commercial livestock development and extension</p> </td> <td> <p>Sindhuli Awareness building and sensitization related program Livestock feed and pasture development Livestock health program</p> </td> </tr> </table> <p>Source: District Development Plan 2011/12 of the respective districts</p> <p>Apart from the above, the Department of Livestock Service is providing direct funding support to different district for implementation of livestock-related projects/programs. Among these, the top three priority projects/programs in 2011/12 fiscal year in each district are listed in the table below:</p> <table border="1"> <tr> <td> <p>Kavre Livestock development services Livestock market development program</p> </td> <td> <p>Ramechhap Livestock development services Leasehold forest and livestock development</p> </td> </tr> </table>		<p>Kavre Partnership program for a livestock facility development Commercial livestock development and extension Livestock health program</p>	<p>Ramechhap Awareness building and sensitization related program Livestock laboratory and vaccination program Livestock feed and pasture development</p>	<p>Dolakha Livestock health program Livestock feed and pasture development Commercial livestock development and extension</p>	<p>Sindhuli Awareness building and sensitization related program Livestock feed and pasture development Livestock health program</p>	<p>Kavre Livestock development services Livestock market development program</p>	<p>Ramechhap Livestock development services Leasehold forest and livestock development</p>
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	Leasehold forest and livestock development	Livestock health service program
	Dolakha Livestock farm development Livestock market development program Leasehold development services	Sindhuli Livestock development services Leasehold forest and livestock development Livestock health service program

Source: Nepal Development Program 2011/12, National Planning Commission

DLSO will also continue these projects/programs, although some modifications will be made following the progress of each development work. Aiming for synergy effect, the DLSO's projects/programs can be combined with the ones proposed by SRCAMP. Each DLSO and DDC is therefore proposed to monitor the progress of preparatory works made by GON for the implementation of post-SRCAMP projects/programs.

Project Duration	DLSOs' activities will be carried out continuously during and even after the M/P period (2014-2020).									
Implementation Schedule	As seen above									
Implementing Agency	Each DLSO in Kavre, Dolakha, Ramechhap and Sindhuli districts									
Indicative Project Cost	According to the District Development Plan and Nepal Development Program of the National Planning Commission, the annual budgets for 2011/12 in the respective DLSOs are as follows:									
	<i>(Unit: Rs. 1,000)</i>									
	Kavre		Dolakha		Ramechhap		Sindhuli		Total	
	(Rs.'000)	(%)	(Rs.'000)	(%)	(Rs.'000)	(%)	(Rs.'000)	(%)	(Rs.'000)	(%)
DADO's original budget										
Projects/Programs	4,883	33.6	2,976	20.5	4,646	32.0	2,022	13.9	14,527	100.0
Capital expenditure	180	4.7	350	9.2	1,460	38.5	1,800	47.5	3,790	100.0
Administration and office operation	14,241	29	12,500	25.5	10,018	20.4	12,339	25.1	49,098	100.0
Sub-total	19,304	28.6	15,826	23.5	16,214	23.9	16,162	24.0	67,415	100.0
Provided by DOA's different Directorates	10,094	23.5	21,533	50.1	8,687	20.2	2,627	6.1	42,941	100.0
Total	29,398	26.6	37,359	33.9	24,811	22.5	18,788	17.0	110,356	100.0

Source: District Development Plan of the respective districts, and Nepal Development Program 2011/12, the National Planning Commission

The livestock development budget (excluding the administration and office operation) per farm household (FHH) is estimated at Rs. 301 on an average in the four districts based on the available data on annual budgets (Rs. 61 million in 2011/12) and the number of FHHs (202,600 in 2011) in four districts. GON is proposed to increase the budget for livestock development taking

	the annual growth rate of GDP in agriculture sector into account. According to data from CBS, it was 4.51% p.a. in 2010/11 and 4.93% p.a. in 2011/12 including the forestry and fishery subsectors.
Project Benefits	<ul style="list-style-type: none"> • Increase of livestock sub-sector productivity and income; • Raise of the standard of living of the farmers and • Creation of more employment opportunities.
Stage of Project	On-going

GO-3: Strengthening of the Function of Agriculture and Livestock Development Centers in the Study Area

Project Number	GO-3
Project Title	Strengthening of the function of Agriculture and Livestock Development Centers in the Study Area
Location	Boanch Horticulture Center in Dolakha district, Spices Crops Development Center in Kavre district, Tuber Vegetable Development Center in Sindhuli district, and Jiri Livestock Development Farm in Dolakha district
Objectives	<ul style="list-style-type: none"> • Increase of production and sale of vegetables using appropriate varieties, and • Increase of milk production raising genetically improved milk cows.
Justification	<p>There are three agriculture development centers and one livestock development farm in the Study Area. Some important characteristics of each center/farm are described as follows.</p> <p>The Boanch Horticulture Center in Dolakha district has a farm area of 16.5 ha located 2,200 m MSL in Dolakha district. It was established in 1977 under Swiss donated Integrated Hill Development Project (IHDP) aiming for horticultural related production technology development for the farmers mainly in three hill districts of Dolakha, Ramechhap and Sindhupalchok. Upon completion of IHDP, its management was handed over to GoN in 1988. Even with a small budget arranged by GoN after IHDP, the center had been operated for about ten years for production of temperate fruit saplings and vegetable seeds. During 1999-2008 period, however, all the management and research facilities have become nonfunctional due to the national conflict. The renovation works including the construction of new training center was started in 2009 when the new management team was appointed to the center by DOA. At present, the center is functional by forming a multiparty farm support committee and by coordinating with the district level institutions.</p> <p>The Spices Crops Development Center in Kavre district was established in 1974 as a horticulture development center for the development and extension of appropriate horticulture crops in mid-hill area. In 2004, the center was renamed following the change of its target crops from horticulture to spices. The center is responsible for spices crops development for more production by conducting awareness campaign for the farmers mainly in Kavre, Sindhupalchou, Dolakha and Ramechhap districts. In addition to the spices crops, the center produces vegetable seeds and seedlings, and fruits seedlings for more production of these crops. Its land area is about 7.5 ha in which farms, office building, quarter, training hall and storage are available. The center is currently operated by seven permanent and eleven contract staff giving priority for production and sale of seeds/seedlings of spices and fruits.</p> <p>The Tuber Vegetable Development Center in Sindhuli district was established in 1974 for crop exhibition, and production and distribution of crop seeds. In 1981, the center additionally started technical support for junar production, and production and distribution of junar seedlings for the farmers mainly in Sindhuli and Ramechhap districts. It is currently responsible for the selection of appropriate varieties of tuber/root crops, fruits seedlings production and distribution, vegetable seeds production and distribution, and technical support for the farmers producing tuber/root crops, junar and vegetables. The total land area is about 6.65 ha in which farms, office building, quarter, training hall, dining hall, guest house and grafting house are available.</p>

	Regarding the livestock subsector, there is the Livestock Development Farm in Jiri, Dolakha district. This farm was established in 1959 with support also from Switzerland. It has 85 ha of area, and making the services for production of crossbred bull and boar aiming at genetic improvement and sale of these farm animals for the farmers. At present, the Livestock Development Farm raises 120 heads of milk cow and 17 heads of swine including two Yorkshire boars.
Project Description	<p>The priority programs at present in the Boanch Horticulture Center are: kiwifruit production technology and seedling distribution; orthodox tea production technology and seedling distribution; production and distribution of sapling of temperate fruits such as apple, pear, plum, peach and walnut; vegetable foundation seed production; potato seed production; and technology extension programs training, farmer's field visit and monitoring. Those in the Spices Crops Development Center are: production and distribution of spices/fruits seeds and seedlings; production and distribution of flower seedlings; operation of vegetable crop museum; gene conservation activities; and providing field training to the farmers. Those in the Tuber Vegetable Development Center are: production and distribution of fruits seedlings and vegetable seeds; and technical extension services for the farmers producing tuber/root crops and vegetables.</p> <p>In addition to the abovementioned programs, SRCAMP proposes these centers to carry out trials of temperate vegetables, as an additional function, in order to know recommendable vegetables/varieties seasonally in the study districts, because SRCAMP clarified that vegetable is one of the important high-potential products for production both for the domestic and international markets. As for the Livestock Development Farm in Jiri, within the framework of the SRCAMP's BDS, it is proposed to increase the production capacity of crossbred bull that can be distributed to the farmers for improvement of their stock of milk cows more rapidly.</p>
Project Duration	All three Agriculture Development Centers and Livestock Development Farm will be operated continuously during and even after the M/P period (2014-2020).
Implementation Schedule	As seen above
Implementing Agency	DOA and DLS
Indicative Project Cost	-
Project Benefits	<ul style="list-style-type: none"> • Increase of agricultural productivity and income • Raise of the standard of living of the farmers
Stage of Project	On-going

GO-4: Establishment of Fruits Juice Processing Plant

Project Number	GO-4																								
Project Title	Establishment of fruits juice processing plant																								
Location	Sindhulimadi, Sindhuli District																								
Objectives	Production and sale of concentrated fruit juice																								
Justification	Sindhuli district is a famous junar (sweet orange) production area in Nepal. According to 2011/12 data, Sindhuli district alone produces about 9,700 tons of junar which accounts for 24% of total junar production in Nepal (which is 39,700 tons). The number of farm households (FHHs) producing junar is about 3,000 in Sindhuli district. The average production volume per FHH is thus estimated to be about three tons. Harvesting season of junar is of November-January period, and a lot of junar is marketed in these three months. As a result, fresh junar supply to the market exceeds the demand usually during the harvesting season. On the other hand, demand of fruits juice is in increasing tendency in Nepal. Against the above background, the construction of fruits processing plant was commenced by private sector with the support of FNCCI/AEC.																								
Project Description	According to the plan, the annual processing capacity is 6,750 tons of fresh fruits for production of 3 million liters of concentrated juice. The plant is operated for six months a year as per the availability of fruits in long-term contractual agreement with the local farmers who also represent the shareholders of the company. The initial investment for the construction is about Rs. 4.4 million consisting of fixed capital (Rs. 22 million) and working capital (Rs. 22 million). The company will be registered under the Company Act in Kathmandu registration office. It will be managed and operated in partnership with community private partnership model. Share of the company is planned to be distributed in equal ratio with local community, district chamber, cooperate house and donors.																								
Project Duration	Construction period: 2013-2014 (about two years)																								
Implementation Schedule	Operation for juice production will start from 2014/15 citrus production season.																								
Implementing Agency	Private sector coordinating with producer groups/cooperatives and FNCCI/AEC																								
Indicative Project Cost	Rs. 44 million																								
Project Benefits	<p>The projected profit and loss according to the financial statements analyses of the processing plant are as follows:</p> <p align="right"><i>(Unit: Rs. 1,000)</i></p> <table border="1"> <thead> <tr> <th></th> <th>1st year</th> <th>2nd year</th> <th>3rd year</th> <th>4th year</th> <th>5th year</th> </tr> </thead> <tbody> <tr> <td>Total Sales</td> <td>131,196</td> <td>192,871</td> <td>318,237</td> <td>466,883</td> <td>642,301</td> </tr> <tr> <td>Total Direct Costs</td> <td>84,281</td> <td>113,004</td> <td>170,884</td> <td>238,132</td> <td>327,420</td> </tr> <tr> <td>Gross Profit</td> <td>46,935</td> <td>79,866</td> <td>147,353</td> <td>228,752</td> <td>314,881</td> </tr> </tbody> </table>		1 st year	2 nd year	3 rd year	4 th year	5 th year	Total Sales	131,196	192,871	318,237	466,883	642,301	Total Direct Costs	84,281	113,004	170,884	238,132	327,420	Gross Profit	46,935	79,866	147,353	228,752	314,881
	1 st year	2 nd year	3 rd year	4 th year	5 th year																				
Total Sales	131,196	192,871	318,237	466,883	642,301																				
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	Total Administration and Marketing Cost	33,208	52,043	89,413	167,021	245,254
	Earnings before Interest and Tax (EBIT)	13,727	27,823	57,940	61,731	69,627
	Interest	1,800	1,541	1,251	927	563
	Earnings before Tax (EBT)	11,927	26,282	56,689	60,804	69,064
Source. Financial Statements Analyses of the Processing Plant, FNCCI/AEC						
<p>In addition to the profit of the processing plant, junar production farmers in Sindhuli and nearby districts are expected to have an alternative market for selling their products as a raw material to the plant. Moreover, the plant itself will provide job opportunities for 15 unskilled labors as factory workers. According to the company's organization and management plan, the total number of staff will be 25 including the unskilled labors.</p>						
Stage of Project	Under construction (as of December 2013)					

GO-5: ODOP (One District One Product) Program

Project Number	GO-5
Project Title	ODOP (One District One Product) program
Location	The program covers all 75 districts of the country including the study districts of Kavre, Dolakha, Ramechjhap and Sindhulii.
Objectives	<p>The overall objective of the program is to identify and focus on utilizing local skills, available raw materials to create enterprises and employment opportunities for the balanced economic growth. Other objectives are:</p> <ul style="list-style-type: none"> • Quality and commercial production of local products; • Optimum use of local resources and local skills; • Processing of the products; • Attractive and globally accepted packaging development; • Branding of the products, and • Internal and external market promotion.
Justification	<p>The OVOP program started in 2006 in Nepal with introduction of OVOP's three principles: i) local yet global, ii) self reliance, and iii) creativity and human resource development. For the implementation, GoN has established coordination committees at the central and the district levels. The central level OVOP program implementation committee is coordinated by the chairperson of FNCCI. The two joint coordinators of this committee are the Joint Secretary (ABPSD) of the MOAD and the Chairperson of the AEC/FNCCI. Likewise, at the district level, the District Level Program Implementation Committee has been formed. The coordinators of this committee are the chairperson of the District Chamber of Commerce and Industry and the chief of DADO.</p> <p>As the pilot projects, the OVOP program includes 8 commodities in 11 districts: <i>junar</i> (<i>Citrus sinensis</i>) in Sindhuli and Ramechhap districts, <i>lokta</i> (<i>Daphne papyracea</i>) in Dolakha district, <i>lapsi</i> (Hug plum) in Bhaktapur district, rainbow trout in Nuwakot and Rasuwa district, <i>bael</i> (<i>aegle marnelos</i>) in Siraha and Bardiya districts, cymbidium orchid in Lalitpur district, agro-tourism in Kaski district, and coffee in Syangja district.</p> <p>Review of the program implementation reveals that GoN has been increasing its budget every year. In the first year (2006/07), a total of Rs. 3.7 million was allocated which has been increased by nearly nine times in 2007/08 (Rs. 31.5 million). In 2008/09, the government has allocated a total of Rs. 35.37 million.</p> <p>The government of Japan has provided supports to the program through the dispatch of JICA expert and volunteers, construction of a storage facility in Sindhulimadi and training of producers in Japan.</p>
Project Description	In 2012, FNCCI formulated a plan of "One District One Product" (ODOP) recognizing the importance of OVOP. FNCCI envisaged a balanced economic growth strategy for rural development program through the concept of ODOP. It is planed that ODOP will be implemented in all 75 districts of the country. A total of 46 different types of products which have more

	<p>potential for local economic growth and eight products which were already identified by OVOP/Nepal are proposed under the ODOP program. For the study districts, <i>junar</i> in Sindhuli and Ramechhap districts and <i>lokta</i> in Dolakha district will be promoted continuously, and <i>lapsi</i> is newly selected in Kavre district according to the plan.</p> <p>The policy envisages creating a “Basket Fund” for ODOP program implementation. The basket fund is aimed at gathering the funding secured for the implementation of the ODOP program in the country. For managing the basket fund, a “Basket Fund Sub-Committee” has been formed under the coordinator-ship of the Joint Secretary of Agri-Business Promotion and Statistics Division (ABPSD) of MOAD. The fund is managed jointly by the Executive Director of AEC and the Joint Secretary (ABPSD) of MOAD.</p>
Project Duration	ODOP program will be carried out continuously during and even after the M/P period (2014-2020).
Implementation Schedule	As seen above
Implementing Agency	AEC/FNCCI coordinated with the central level ODOP program implementation committee and the District Level Program Implementation Committee
Indicative Project Cost	For whole country, about Rs. 248 million will be needed during the M/P period (2014-2020), if Rs. 35.37 million of budget (which the same amount with 2008/09 budget for OVOP program) is allocated every year for the ODOP program implementation.
Project Benefits	<ul style="list-style-type: none"> • Alleviation of poverty in local community, and • Empowerment of local people through their entrepreneurship development.
Stage of Project	On-going

GO-6: Road Network Improvement (3 Bridges across Major Rivers by DOR, Rural Roads based on DTMPs 2013-2018)

Project Number	GO-6
Project Title	Road network improvement (3 bridges across major rivers by DOR, rural roads based on DTMPs 2013-2018)
Location	Kavre, Dolakha, Ramechjhap and Sindhuli districts
Objectives	Prevention of further widening of the regional gaps and improvement of people's life quality
Justification	<p>Road network is very important infrastructure for socioeconomic development. In Nepal, the road network is made of national highways, feeder roads, urban roads, district roads and village roads in which agricultural roads are included. National highway together with the feeder road forms the Strategic Road Network (SRN) of the country whereas district road, urban road together with the village road forms the Local Road Network (LRN). The construction and maintenance of the strategic road (highway and feeder road) is the responsibility of the Department of Roads whereas that of local road (district roads, urban roads and village roads) lies with local bodies (DDC, VDC and municipality) together with the Department of Local Infrastructure Development and Agricultural Road (DOLIDAR).</p> <p>Regarding the study districts, the Sindhuli Road, as the second highway connecting Kathmandu valley to Terai plain with the entire route of around 160 km, is under construction with the grant aid of the GoJ and scheduled to be fully opened in 2014. Besides this highway, however, the local roads network remains still underdeveloped both in terms of density and in terms of quality of roads.</p>
Project Description	<p>DOLIDAR has been assisting DDCs in preparation of District Transport Master Plan (DTMP). DOLIDAR has prepared guidelines for the preparation of DTMP called Approach Manual for Rural and Agricultural Roads, which is the only government's guideline for preparation of DTMP. The overall objective of the DTMP is to develop network of roads in planned and sustainable manner by adopting labor based, local resources oriented, and environment friendly techniques following the decentralized participatory approach, and to facilitate accessibility to important market centers and areas with resource potentiality to guide the systematic arrangement for rural settlements, markets and services centers of the district.</p> <p>All four districts have prepared district transport master plan for the period of 5 years (2013-18). It has prioritized roads for repair and rehabilitation of the roads. District Transport Perspective Plan is simply the list of all the identified interventions that are necessary to bring the roads to a maintainable all-weather standard and keep them there, as well as the construction of any new roads considered necessary to complete the District Core Road network.</p> <p>Guided by the above perspective plan, each district has prepared five-year district transport master plan as summarized in the table below.</p>

Five-Year Road Development Plan (2013-2018)

Road type	Kavre		Dolakha		Ramechhap		Sindhuli		Total or Average	
	(km)	(%)	(km)	(%)	(km)	(%)	(km)	(%)	(km)	(%)
Fair-weather	396.7	58.2	224.4	71.0	454.5	73.4	153.6	52.3	1,229.3	64.3
All-weather gravel	272.7	40.0	91.7	29.0	293.7	47.4	139.1	47.4	797.2	41.7
All-weather blacktop	12.2	1.8	0.0	0.0	0.0	0.0	1.0	0.3	13.2	0.7
Total	681.6	100.0	316.1	100.0	619.4	100.0	293.7	100.0	1,910.9	100.0

Source: Computed from District Road Network Development Plan (2013-2018) of Kavre, Dolakha, Ramechhap and Sindhuli districts, 2013

Beside the above road development plan, the following three bridges are under construction at present directly by the central government (Dept. of Roads), and expected to be completed at the early stage of the Master Plan period.

New Bridge Construction Plan

Bridge	Connects	Planned year of completion	Likelihood of timely completion
Ratamata	Jhangajholi Ratamata with Siktaghar	2015	Likely
Akase	Manthali with Chisapani	2014	Likely
Nepalthok	Information not available		

Source: Discussion with a staff at Department of Road

Project Duration	This is the five-year plan for 2013-18 period. However, the local roads construction will be carried out even after the five-year plan.																																											
Implementation Schedule	2013 - 2018																																											
Implementing Agency	DDC and VDCs in Kavre, Dolakha, Ramechhap and Sindhuli districts with DOLIDAR support for the local roads construction, and the Department of Roads for three bridges																																											
Indicative Project Cost	<p>The table below presents five-year projected financial plan of the DTMP. Sources of fund includes mainly DDC development grant, VDC allocation, DDC's and VDC's own resources, DOLIDAR support, GoN's Grant and support from donor agencies.</p> <p>Five-Year Financing Plan for Road Development (2013-2018)</p> <table border="1"> <thead> <tr> <th rowspan="2">Sources of fund</th> <th colspan="2">Kavre</th> <th colspan="2">Dolakha</th> <th colspan="2">Ramechhap</th> <th colspan="2">Sindhuli</th> <th colspan="2">Total or Average</th> </tr> <tr> <th>(Rs. '000)</th> <th>(%)</th> <th>(Rs. '000)</th> <th>(%)</th> <th>(Rs. '000)</th> <th>(%)</th> <th>(Rs. '000)</th> <th>(%)</th> <th>(Rs. '000)</th> <th>(%)</th> </tr> </thead> <tbody> <tr> <td>Community</td> <td>0</td> <td>0.0</td> <td>0</td> <td>0.0</td> <td>676,451</td> <td>20.0</td> <td>34,987</td> <td>1.8</td> <td>711,438.0</td> <td>10.8</td> </tr> <tr> <td>DDC</td> <td>166,582</td> <td>17.7</td> <td>134,312</td> <td>43.0</td> <td>3,053</td> <td>0.1</td> <td>39,286</td> <td>2.0</td> <td>343,233.0</td> <td>5.2</td> </tr> </tbody> </table>	Sources of fund	Kavre		Dolakha		Ramechhap		Sindhuli		Total or Average		(Rs. '000)	(%)	(Rs. '000)	(%)	(Rs. '000)	(%)	(Rs. '000)	(%)	(Rs. '000)	(%)	Community	0	0.0	0	0.0	676,451	20.0	34,987	1.8	711,438.0	10.8	DDC	166,582	17.7	134,312	43.0	3,053	0.1	39,286	2.0	343,233.0	5.2
Sources of fund	Kavre		Dolakha		Ramechhap		Sindhuli		Total or Average																																			
	(Rs. '000)	(%)	(Rs. '000)	(%)	(Rs. '000)	(%)	(Rs. '000)	(%)	(Rs. '000)	(%)																																		
Community	0	0.0	0	0.0	676,451	20.0	34,987	1.8	711,438.0	10.8																																		
DDC	166,582	17.7	134,312	43.0	3,053	0.1	39,286	2.0	343,233.0	5.2																																		

	GoN	555,249	59.1	16,117	5.2	616,615	18.2	1,045,838	53.7	2,233,819.0	33.9
	Donor/Project	217,515	23.2	161,846	51.8	1,622,754	47.9	612,342	31.5	2,614,457.0	39.7
	VDC	0	0.0	0	0.0	161,175	4.8	213,526	11.0	374,701.0	5.7
	Other	0	0.0	0	0.0	305,255	9.0	0	0.0	305,255.0	4.6
	Total	939,346	100.0	312,275	100.0	3,385,303	100.0	1,945,979	100.0	6,582,903.0	100.0
Source: Computed from District Road Network Development Plan (2013-2018) of Kavre, Dolakha, Ramechhap and Sindhuli districts											
Project Benefits	<ul style="list-style-type: none"> • Increase of regional and people's income through economic revitalization • Raise of the standard of living of the people • Creation of more employment opportunities 										
Stage of Project	On-going										

GO-7: The Special Economic Zone Project (SEZP), Panchkhal, Kavre District

Project Number	GO-7
Project Title	The Special Economic Zone Project (SEZP), Panchkhal, Kavre district
Location	Panchkhal, Kavre 3.0 K.M. east from Panchkhal Bazaar, 50 Ha
Objectives	To attract foreign and national investors to invest and establish industrial and business units, which will contribute in increased promotion of export.
Justification	Export industry sector is a major driving force for the Nepalese economy. As the national investment capacity is low, significant expansion of the export industry depends on the attraction of foreign investment bringing in technology, marketing expertise and capital.
Project Description	<p>GoN has formed the Special Economic Zone Development Committee (SEZDC) under Ministry of Industry, to formulate laws, rules and regulation, implement planning, design and construction of Special Economic Zones throughout Nepal and to carry out relevant works. Special Economic Zone (SEZ) is the advanced concept of Export Processing Zone, and is also called the "Free Trade Zones" which includes Export Processing Zones, Special Trade Zones, Tourism-Entertainment Zones, Information and Technology Parks, Banking etc. The committee has identified 14 different sites of the country as SEZ, including Panchkhal area of Kavre.</p> <p>Up until now, the Feasibility study completed, and Environmental Impact Assessment is ongoing. According to the national plan of 2013/14 the government will acquire land of Panchkhal area in this fiscal year.</p>
Project Duration	
Implementation Schedule	<ol style="list-style-type: none"> 1) Formulation of Special Economic Zone Ordinance-2005 and related rules. 2) Feasibility Study for the Identification of Sites, Infrastructure Development and Design and Cost Estimates of the establishment of SEZ and land acquisition in those areas. 3) Detailed design and construction of the facilities.
Implementing Agency	Ministry of Industry
Indicative Project Cost	
Project Benefits	
Stage of Project	On-going

Source: http://www.seznepal.gov.np/sez/page.php?page_id=15

DN-1: High Mountain Agribusiness and Livelihoods Improvement Project (HIMALI)

Project Number	DN-1
Project Title	High Mountain Agribusiness and Livelihoods Improvement Project (HIMALI)
Location	Dolakha will become one of the target areas in SRC area in 2014. (Other target districts are; Rasuwa, Sankhuwasabha, Solukhumbu, Dolpa, Jumla Humla, Mugu; Manang and Mustang)
Objectives	To assist farmers and downstream enterprises to strengthen linkages, taking advantage of the gradual improvement in infrastructure, to realize the existing demand for mountain products.
Justification	On the socio-economic side, there is widespread poverty among the inhabitants of high mountain districts. Rising population and their heavy dependence on land and forest resources have led to their over-exploitation, causing negative environmental changes. The project will improve income and standard of living of the people in high mountain areas. The project will also improve mountain communities' resilience to climate change by supporting the implementation of elements of community climate change adaptation action plans and community forestry and rangeland group action plans for timber, grazing, and medicinal plants collection.
Project Description	The project has three components: (i) mountain agribusiness development, (ii) value chain capacity development, and (iii) project management. The project uses a demand-driven approach to (i) mobilize interested producer groups; (ii) provide support for quality improvement, value adding, and product aggregation into quantities of scale sufficient to attract demand-side business; (iii) stimulate private sector agribusiness development; and (iv) reduce risk exposure to businesses investing in the high mountain districts. Project grants are provided to the eligible entities for implementing viable agribusiness plans and projects that demonstrate income and employment benefits in the project districts.
Project Duration	2011-2017
Implementation Schedule	
Implementing Agency	MOAD is the executing agency. Department of Livestock Services (DLS) is an implementing agency and responsible for overall project management and coordination. AEC is an implementing agency and responsible for implementation of part of component 1. Funded by Asian Development Bank
Indicative Project Cost	USD 30.23 million. The ADB grant will finance 66% of the indicative project cost, and the government is to provide \$4.52 million equivalent to finance 15% of the indicative project cost. Beneficiaries sharing in the agribusiness investments will provide an estimated \$5.71 million, or 19% of the indicative project cost.
Project Benefits	
Stage of Project	On-going

DN-2: Community-Managed Irrigated Agriculture Sector Project (CMIASP)

Project Number	DN-2
Project Title	Community-Managed Irrigated Agriculture Sector Project (CMIASP)
Location	The project is implemented in Rural areas of Central and Eastern Development regions (Bagmati, Narayani, Janakpur, Sagarmatha, Koshi and Mechi). All four SRC districts are included in the target district.
Objectives	The Project aims to improve the agriculture productivity and sustainability of existing small and medium farmer-managed irrigation systems (FMIS) suffering from low productivity and poverty in Central and Eastern Development Regions thereby enhancing the livelihoods of the poor.
Justification	In Nepal, irrigation is an essential input to improve agriculture productivity, which remains the lowest among the neighboring countries. The current Agriculture Perspective Plan (APP) has prioritized irrigation as the foundation of a modern production system, with emphasis on improving the performance of traditional surface water FMIS, which account for 55% of the total irrigated area and 23% of net cultivated area of 2.6 million ha. FMIS offer good scope for enhancing productivity, expanding the command area at relatively low cost, and short lead time, and building on the existing WUA capacities through a participatory approach, and 0.3 million ha currently requiring urgent rehabilitation. The Project is designed to address many challenges and is needed to renovate the remaining subsistence FMIS to attain their maximum sustainable benefits, particularly those for the poor and the disadvantaged, with sound sector governance.
Project Description	The objectives are achieved through (i) providing improved means for WUA empowerment, irrigation infrastructure (25 to 60 Ha coverage capacity), agriculture extension, and targeted livelihood enhancement to build the human capital of the poor; and (ii) strengthening policies, plans institutions and their operations for more responsive service delivery and sustainable impacts. In Kavre district, three FIMS have been implemented.
Project Duration	2006-March. 31, 2014
Implementation Schedule	
Implementing Agency	Funded by ADB. Ministry of Irrigation is the executing agency.
Indicative Project Cost	USD 38.6 million (20 million by ADB loan, 0.7 million by OPC loan, 11.6 million by the government)
Project Benefits	Enhance agricultural productivity and sustainability of existing FMIS by: (i) Providing improved measures for WUA mobilization, infrastructure, agriculture development and targeted livelihood enhancement to build the human capital of the poor including women and disadvantaged groups and other support services; and (ii) Strengthening policies, plans, institutions and operational mechanisms for more responsive service delivery and sustained impacts.
Stage of Project	On-going

DN-3: Roads Connectivity Sector I

Project Number	DN-3
Project Title	Roads Connectivity Sector I
Location	Sunkoshi Bridge
Objectives	The principal objective is to reduce the isolation of remote rural communities, mostly in the hilly region by enhancing access of the poor to basic services, employment opportunities, and service centers of health and education in major towns and district headquarters.
Justification	The country has one of the lowest road densities for a landlocked country, with some villages as far as 13 days walk from the nearest road. The lack of connectivity is a serious constraint for economic development and social inclusion.
Project Description	<p>Components of the project consist; (i) road connectivity (ii) Connected district headquarters (iii) Maintain SRN (iv) Road safety capacity improved in DOR (v) Strengthen road safety database (vi) Prevention of overloading (vii) Building capacity of DOR and local contractors increased (viii) HIV/AIDS and anti-trafficking component.</p> <p>As for the Road Connectivity: A total of 239.91 km of sample and 78 km non sample feeder roads have been upgraded to fair weather standard under the Project. Civil works of 22 contract packages have been completed. Three district headquarters are connected to all weather road for the first time (Dhunche of Rasuwa, Manthali of Ramechhap, and Taplejung of Taplejung districts). (as of Oct. 2013)</p>
Project Duration	2006-2013
Implementation Schedule	Grant closing date extended from 30 June 2013 to 31 July 2014 to complete construction of Sunkoshi Bridge.
Implementing Agency	
Indicative Project Cost	US\$ 80 million (ADS grant 55.20 million, OPEC loan 10 million, the government 14.8 million)
Project Benefits	Reduce poverty of isolated people in the hilly northern part of Nepal, and support economic growth of rural communities
Stage of Project	On-going

DN-4: Project for Agriculture Commercialization and Trade (PACT)

Project Number	DN-4
Project Title	Project for Agriculture Commercialization and Trade (PACT)
Location	Currently it is operating in 25 districts, but will be expanded to 75 districts in 2014. All four SRC districts will be included in these 75 target districts, starting 2014.
Objectives	To improve the competitiveness of smallholder farmers and the agribusiness sector in selected commodity value chains in 25 districts.
Justification	The objective of the project is in line with the government policy of commercialization. This project aims to attain objectives by (i) helping farmer groups and cooperatives engage in profitable market-oriented production and improved access to markets through the provision of technology and information services and critical public infrastructure and linkages to agribusiness; (ii) creating and strengthening industry-wide partnerships along the value chain, thus forging linkages between producers, traders, processors, and other stakeholders and, (iii) reducing existing obstacles to agriculture and food trade thereby increasing the ability of farmers and agribusiness to respond to sanitary, phyto-sanitary (SPS) and food-quality standards to meet domestic and international market requirements.
Project Description	<p>This project has the following three components :</p> <p>Component 1: Agriculture and Rural Business Development: to enable farmers to engage in profitable market-oriented production and to promote partnerships and market linkages with other value chain participants and agribusinesses. The component will help agro-enterprises, commodity associations, cooperatives, registered farmer groups/organizations and technology and service providers to actively engage in the development of commodity value chains by partially financing demand-driven investment proposals through competitive matching grants. The component will also support investments aimed at creating viable enterprise-based farmer institutions that are linked to other value chain participants and are actively engaged with the markets.</p> <p>Component 2: Support for Sanitary and Phyto-sanitary Facilities and Food Quality Management: Support for Sanitary and Phytosanitary Facilities and Food Quality Management: This component aims to strengthen the efficiency and effectiveness of Sanitary and Phytosanitary services in order to reduce existing obstacles to agricultural and food trade. It also aims to support the private sector's efforts to gain market advantage through improved food quality management.</p> <p>Component 3: Project Management and Monitoring and Evaluation: to finance overall project management, monitoring and evaluation and reporting. This component will also support a Project Management Team (PMT).</p> <p>In the components I and II, the project provide matching grants to target groups on project proposal basis. The small grant amount is up to US\$ 35,000 (for all groups) per project and medium grant is up to US\$ 100,000 per project (cooperatives, producer groups, and private firms). Technical assistance for the preparation of proposal is also given under the project.</p>

Project Duration	2009-2015
Implementation Schedule	
Implementing Agency	MOAD is the executing agency (Project Management Unit supported by the component III is actually implementing). Funded by World Bank
Indicative Project Cost	US\$ 26.55 million. \$ 20 million is International Development Association (IDA) credit/grant, \$5.82 million is beneficiary contribution in cash and kind and \$0.73 million is the government contribution.
Project Benefits	
Stage of Project	On-going

Source: <http://www.pact.gov.np>

DN-5: Poverty Alleviation Fund Project (PAF) II

Project Number	DN-5
Project Title	Poverty Alleviation Fund Project (PAF) II
Location	The project is implemented in 55 district and three districts of SRC areas, Dailekh, Ramechhap and Sindhuli are included.
Objectives	To improve living conditions, livelihoods and empowerment among the rural poor, with particular attention to groups that have traditionally been excluded by reasons of gender, ethnicity, caste and location.
Justification	After about eight years on the ground, the PAF has successfully reached out to most vulnerable groups, especially those who are disadvantaged due to gender, caste, ethnicity or physical isolation. PAF has demonstrated that even modest amounts of resources given through community-led development process can help many poor families get on a sustainable path out of poverty. The continuation of a politically fluid environment in Nepal, assurances of support for food security and poverty reduction are strong and remain constant across Government and across the political spectrum.
Project Description	Main components includes; 1) social mobilization, 2) income generation, 3) community infrastructure construction and 4) capacity building. In relation with the SRCAMP Master Plan, community irrigation systems may be constructed under this project.
Project Duration	2007 – 2016 (Originally it was planned to end in 2012, but additional funding extended the project four more years)
Implementation Schedule	
Implementing Agency	The PAF Board, chaired by the Prime Minister. The PAF Vice Chairman functions as a full time executive of PAF, and the Board includes ten other members. The Executive Director of PAF serves as the Secretary of the Board. The ex-officio members are the Secretary of the National Planning Commission, the Chairpersons of the Federation of the District Development Committee, the Village Development Committee, the National Women’s Commission and the National Dalit Commission.
Indicative Project Cost	Total cost is USD 100.2 million (WB 80 million, IFAD 5 million, local beneficiaries 6.7 million, government 8.5 million)
Project Benefits	
Stage of Project	On-going

DN-6: Leasehold Forestry and Livestock Program (LFLP)

Project Number	DN-6
Project Title	Leasehold Forestry and Livestock Program (LFLP)
Location	The project covers 22 districts. All four districts are included in the target districts. The program pays particular attention to those who live in areas adjacent to degraded forest lands and cannot secure enough food for their families year-round.
Objectives	To reduce poverty by allocating leasehold forestry plots to poor families, thus enabling them to increase their income from forest products and livestock. <ul style="list-style-type: none"> • Improve household forage and tree crop production • Increase household production of livestock, especially goats • Provide access to microfinance services • Support the government's capacity to implement leasehold forestry in a gender-sensitive way
Justification	The program is designed to help address poverty and social inequity by providing the poor with access to land on 40-year renewable leases. Second, leasehold forestry is an effective way of both reducing poverty and reforesting the hills. Third, the PRSP/Tenth Plan has designated leasehold forestry for the poor as a priority program with the highest priority ranking (P1). The LFLP will assist the Government in financing this PRSP priority. Finally, both leasehold and community forestry approaches are appropriate, complementary and can be implemented and coordinated at district level within an overall district forestry management plan.
Project Description	The program has the following four components: Component 1: leasehold forestry and group formation to improve household forage and tree crop production from secure and sustainable management of leasehold plots Component 2: Livestock development to improved household production of small livestock (goats) Component 3: Rural financial services to establish viable microfinance institutions providing Component 4: services to lease holders' program management and coordination support to enhance Government's capacity to implement leasehold forestry as a national poverty reduction program in a gender-sensitive way.
Project Duration	2005 – 2014 (Original plan was until 2012, but extended to 2014)
Implementation Schedule	
Implementing Agency	Ministry of Forests and Soil Conservation is the executing agency. Department of Forests and Department of Livestock Services are the implementing agencies.

Indicative Project Cost	Total cost is US\$16.0 million (US\$ 11.7 is funded by IFAD)
Project Benefits	The program will seek to mitigate vulnerability; improve access to essential services and natural resources; support livelihood components (livestock and forestry) with market potential as well as providing access to savings and credit services at the village level; and support empowerment women through mainstreaming gender by recruit and train women group promoters and village livestock assistants to provide services and training to the target groups.
Stage of Project	On-going

DN-7: Agriculture and Rural Development Program

Project Number	DN-7
Project Title	Agriculture and Rural Development Program
Location	Ramechhap District is one of the target districts in SRC area.
Objectives	To Improve livelihood and increase resilience for people especially Disadvantaged Groups living in rural and small urban centers
Justification	In order to promote Agriculture Commercialization, the government (DADO)' capacity in research and extension has to be strengthened. Complementary, it is essential to involve private sector actors, including traders, Agro-bets and input producers, into extension activities. Agriculture commercialization should be led by the private sectors and farmers.
Project Description	The program will consist of two projects: 1) Research & Extension Project: develop DADO's capacity in Research and Extension 2) Agriculture Commercialization: establish linkage between production sites and market and promote agricultural marketing, engaging the private sectors. (it will draw experiences and lessons from other projects implemented by other donors, including "Katalyst" in Bangladesh by multi-donors and "Smarth" in Nepal by DfID.)
Project Duration	10 years
Implementation Schedule	Starting in 2015
Implementing Agency	Swiss Development Cooperation
Indicative Project Cost	Not yet decided
Project Benefits	
Stage of Project	Pipe-line

DN-8: Vegetable Seed Project (VSP), Phase 3

Project Number	DN-8
Project Title	Vegetable Seed Project (VSP), Phase 3
Location	The project will operate in 16 districts including the seven Swiss cluster districts i.e. Khotang, Okhaldhunga and Ramechhap (Swiss Agency for Development and Cooperation SDC cluster) and Kalikot, Jajarkot, Dailekh and Achham (Helvetas cluster). Ramechhap is one of the target areas in SRC area.
Objectives	To have improved food security and income for the poor and disadvantaged households (HHs) in remote areas of Nepal, special focus on; 1) farm families from poor and DAGs produce and sell quality seeds, and 2) National Seed Board (NSB), NARC and DoA enforce decentralized seed production and quality control through both public and private institutions.
Justification	There is a huge gap between the demand and supply of vegetable seed in Nepal. SDC's contribution to the seed production program of local NGO, CEAPRED started since 2004. Since then more than 6514 farm families are engaged in seed production growing seeds of 55 varieties of 27 vegetable crops. The study of the previous phases shows that the project has been able to increase the improved seed availability and income, improving substantially the food security of poor and Disadvantaged Groups (DAGs). Similarly, producing the seeds through farmers groups and cooperatives has been a successful approach, which allows a sustainable national seed production.
Project Description	<p>The new phase of the project will focus on consolidating the achievements on improved vegetable seed production and market linkages. It will seek to reorient its focus on quality assurance through truthful labelling and to promote the adoption of farmers' selected seed and technologies. Moreover, the farmer's cooperative based seed production program will remain its prime focus and the policy thrust will be on decentralized seed quality assurance provisions.</p> <ul style="list-style-type: none"> • The project foresees that at least 60% of disadvantaged groups and 50% women will be represented in seed producer groups. • CEAPRED Nepal will implement the program in close collaboration with the Government of Nepal (GoN) agencies, private seed entrepreneurs, NGO/Community based organizations and farmer's groups. • VSP team will work on the group mobilization, provide technical support in seed production, dissemination and marketing. VSP-III will work closely with private seed entrepreneurs to establish a formal seed marketing system.
Project Duration	1.1.2011 – 31.12.2014
Implementation Schedule	
Implementing Agency	Funded by Swiss Development Cooperation, and implemented by a local NGO called Center for Environmental and Agricultural Policy Research, Extension and Development (CEAPRED)
Indicative Project Cost	CHF 2,335,000

Project Benefits	<p>The major target groups, i.e. beneficiaries of VSP, are farm households from poor and DAGs in the hills of Nepal and it is expected that by the end of project phase, at least 12,000 households including additional 5486 HHs across 16 program hill districts of Nepal will directly benefit from the project.</p> <p>It is expected that a regional focus and the collaboration with the private sector will improve the timely supply of improved variety of vegetable seeds at local level as well as seed sell through formal contracting system.</p>
Stage of Project	On-going

DN-9: Income Generation Program under Adolescent Girls Empowerment Project

Project Number	DN-9
Project Title	Income Generation Program under Adolescent Girls Empowerment Project
Location	Working in 12 VDCs of Sindhuli Districts: Bhimeswar, Ratanchura, Jalakanya, Bhandrakali, Sithauli, Hatpate, Ranibas, Ranichuri, and Kamalamai for vegetables, and Ranichuri, Bhimsthan, and Belshari and Kamalamai for Milk. In this project, the primary target women under 24 years old. Young women move towards (improve in) economic empowerment
Objectives	To empower women by income generation activities. <ul style="list-style-type: none"> • Gender inequity situation is reduced • Young women's social status and participation increases • Membership based CSOs are established and capacitated
Justification	The project contributes to ensuring that girls and young women have sufficient knowledge and skills to shape their own lives.
Project Description	<p>For economic empowerment of the women, the project mobilizes women into saving and credit cooperatives (in cooperation with the local NGO called Sahamathi (サハマティ sp?). In addition, income generation activities are conducted with the cooperatives for economic empowerment. Horticulture and Milk Production is the focus areas for the income generation activities.</p> <p>Major Activities include:</p> <ol style="list-style-type: none"> 1) Training for farmers' group at local level (sometimes inviting JT/JTAs as trainers) 2) Training for new plastic house tomato production farmers 3) Training for local resource persons (leader farmers) on sustainable vegetable production 4) Refreshment training for plastic house tomato production farmers 5) Seed support for kitchen gardening program 6) Seed support for semi commercial vegetable production 7) Training on mushroom farming 8) Support for irrigation in pocket areas (installing pipe, reservoir tank, spring call irrigation, and their maintenance, etc.) 9) Animal/Livestock health camp (Village Animal Health Workers (VAHW) 育成) 10) Shed improvement and dung management 11) Vegetable collection center 12) Providing crates support 13) Starting and promotion of local market (Haat Bazaar)

	<p>14) Support for dairy chilling center</p> <p>15) Support for establishment agro-vets (financial support and training for management)</p> <p>16) Organizing interaction among stakeholders and farmers</p> <p>17) Exposure visit (outside of own districts) for leader farmers of vegetable production</p> <p>18) Interaction between traders and producers.</p> <p>24 cooperatives have been established in 12 target districts (as of May 2012) . For the financial resources for their income generation activities, the saving and credit mechanism is utilized.</p>
Project Duration	July 2012 to June 2013 (similar activities have been going on since a few years ago)
Implementation Schedule	The project has been implemented in Sindulhi district for more than two years.
Implementing Agency	Funded by Plan Nepal, implemented in cooperation with local NGOs and CBOs
Indicative Project Cost	
Project Benefits	
Stage of Project	On-going

DN-10: Japan Overseas Cooperation Volunteers and Senior Volunteers Program of JICA

Project Number	DN-10
Project Title	Japan Overseas Cooperation Volunteers and Senior Volunteers Program of JICA
Location	Current JOCV/SVs working in SRC area are; 1 JOCV in Shindulhi (Junar Producer Cooperative), 3 JOCVs in Kavre (2 in DADO for Promotion of vegetable production and Rural development, and 1 in DDC for rural development), and 2 SVs in Kathmandu (1 in Junar Center Cooperative and 1 in FNCCI/AEC).
Objectives	The volunteers promote the change in people's attitudes to encourage development of their countries by cooperating with local people and motivating each other in their respective fields. JICA started this program in Nepal from 1970, and has dispatched Japan Overseas Cooperation Volunteers (JOCV) and Senior Volunteers (SV).
Justification	JICA's volunteer program is a grass-roots level cooperation and one of the effective schemes for socio-economic development and reconstruction of developing countries. Through these cooperation activities, participating volunteers can not only contribute to the development of partner countries but also gain valuable experience in terms of international goodwill, mutual understanding and an expansion in their international perspectives.
Project Description	The JOCV/SV are dispatched in the following focus areas in Nepal; 1) Support for strengthening farmers' organizations and increasing the agricultural income generation opportunities, 2) Support public sector and building farming skills, 3) Promotion of agricultural sustainability.
Project Duration	Each volunteer stays in the position only for two years. However, seamless assistance is possible by continuously sending the volunteers to the same position/location/project.
Implementation Schedule	
Implementing Agency	Japan International Cooperation Agency, in cooperation with the volunteers' counterpart organization.
Indicative Project Cost	
Project Benefits	
Stage of Project	On-going

Source: www.jica.go.jp

DN-11: Establishing Sustainable Production and Supply System for High Value Agricultural Crops in the Hilly Areas of Sindhuli District

Project Number	DN-11
Project Title	Establishing Sustainable Production and Supply System for High Value Agricultural Crops in the Hilly Areas of Sindhuli District
Location	Kuseswor Dumja VDC, Sindhuli District
Objectives	<p>Overall goal is that sustainable production and supply system for high value agricultural crops in the hilly areas of Sindhuli district is established as the basis for income generation.</p> <p>Objectives are;</p> <ul style="list-style-type: none"> • Production skill and market access for HVACs (Fruits, Vegetables and Milk) are improved, and • Production environment is preserved and enhanced through agro-forestry and irrigation.
Justification	<p>Nepal has been initiating the process of development and harmonization since 2008. On the other hand, Nepal still suffers from poverty and the difference between districts, castes and ethnic groups remains large. In the government's three-year interim plan (2009/10~2012/13)¹, the crucial importance of regional balances and inclusive economic growth is emphasized for a sustainable development and peace.</p> <p>Sindhuli district is one of the districts suffering from the highest poverty rate in the central development region of Nepal. Project site, Kuseswor Dumja VDC suffers relatively higher poverty rate in Sindhuli district. In terms of demographic structure, indigenous groups, such as Magar, Tamang and Newar, and low castes groups compose more than 80% of population². The low development of Kuseswor Dumja VDC is attributed to the low productivity in agricultural sector due to the lack of irrigation facilities and appropriate skills to topographic conditions. Soil erosion due to the deforestation is also becoming major issue recently. In this context, it is crucial to initiate poverty alleviation in Kuseswor Dumja VDC by increasing income opportunities in agricultural sector with special concern towards inclusive and equitable development. As short and long term priorities, there is a significant scope for promoting high value agricultural crops by utilizing Sindhuli Road Corridor along which Kuseswor Dumja VDC locates.</p> <p>In order to address these major issues in accordance with national government's priority for rural poverty alleviation, GLM Institute plans to implement the project in Kuseswor Dumja VDC, which aims to establish sustainable production</p>

¹ Three Year Plan Approach Paper (2009/10 – 2012/13): National Planning Commission, Government of Nepal, August, 2010. <http://www.npc.gov.np/uploads/publications/20110901113819.pdf>

² Statistics of Sindhuli District 2065 (2008): Sindhuli DDC (District Development Committee)

	and supply system for high value agricultural crops as the basis for income generation through the capacity development of beneficiaries/communities and the technical assistance for small-scale agricultural infrastructures.
Project Description	<p>Project will produce five outcomes in order to achieve project purposes and overall goal; (1) Fruits and vegetable cultivation skills are improved through the capacity development of beneficiaries, (2) Livestock management and milk production skills are improved by increasing the capacity of beneficiaries, (3) Market access for HVACs is improved through the capacity development and technical assistance for communities, (4) Soil erosion is prevented and soil nutrition is improved by increasing the capacity and environmental awareness of communities, and (5) The access to irrigation water is improved by small-scale and pump-up irrigations. The following is the key activities conducted to achieve these outcomes.</p> <p>1) Fruits and vegetable cultivation skills are improved through the capacity development of beneficiaries Project will provide technical assistance to identify appropriate fruit and vegetable crops to topographic conditions, such as altitude, the direction of sloping land and soil condition. Project will provide skill training in high value fruits planting, such as Japanese Pear, Pomegranate and Lime, vegetables cultivation and post harvest to increase the capacity of beneficiaries in producing the market oriented agricultural crops. In terms of technical aspect, project will cooperate with expert(s) from Kirtipur Horticulture Center (from 1st to 3rd year).</p> <p>2) Livestock management and milk production skills are improved by increasing the capacity of beneficiaries Project will provide technical assistance to enhance the capacity of beneficiaries in disease control for livestock. Project will also provide skill training to beneficiaries in the production of milk that is one of the key commodities for income generation in project site (from 1st to 3rd year).</p> <p>3) Market access for HVACs is improved through the capacity development and technical assistance for communities Project will provide technical assistance to enhance the capacity of marketing skills for beneficiary communities. Basing on the progress of skill improvement in HVCs production (from 1st to 2nd year), project will explore the option of marketing facilities; storage, collection center and/or information center, and will provide technical assistance to construct or install the most suitable marketing facility(ies) for enhancing the marketing activities of beneficiary communities (3rd year).</p> <p>4) Soil erosion is prevented and soil nutrition is improved by increasing the capacity and environmental awareness of communities. Project will introduce agro-forestry technique in order to preserve production environment in a sustainable manner. Project will provide technical assistance to identify optimal crop patterns; fruits, vegetables and fodder crops, and skill training in producing organic manure in order to improve the soil nutrition of agricultural land (from 1st to 3rd year). Considering serious soil erosion in the area halfway up the hill, project will rise environmental awareness of beneficiary communities to maintain holistic production environment and initiate the tree planting to increase water retaining capacity</p>

	<p>of the targeted area (from 2nd to 3rd year).</p> <p>5) The access to irrigation water is improved by micro-irrigation and pump-up-irrigation</p> <p>Project will provide technical assistance to install the micro-irrigation that utilizes running water from water supply pipe in the area around the top of the hill. This irrigation is expected to increase the productivity and the quality of agricultural crops, especially vegetables, for beneficiary communities (1st year). In 2nd year when the central electric service is expected to be provided to the project site, project will construct the pump-up irrigation from Koshi river to make the land in the area of halfway up to the hill cultivable during dry season (2nd year). Project will increase the capacity of beneficiary communities to maintain irrigation system in a sustainable manner.</p>
Project Duration	3 years (2012-2015)
Implementation Schedule	
Implementing Agency	<p>Funded by the Japanese Ministry of Foreign Affairs and implemented by GML Institute.</p> <p>Project is carried out in partnership with local non-governmental organization. It coordinates with Sindhuli District Development Committee (DDC), Kuseswor Dumja Village Development Committee (VDC) and other concerned district line agencies. In terms of technical assistance, Project will cooperate with a Japanese expert in agro-forestry and local experts or Junior Technician (JT) and Junior Technical Assistant (JTA) in fruit planting, vegetable cultivation and livestock management.</p>
Indicative Project Cost	Minimum US\$ 300,000 for three years
Project Benefits	The project contributes to establishing Sustainable HVCs (High Value Crops) Production and Supply System in Sindhuli district.
Stage of Project	On-going

DN-12: UNNATI -Inclusive Growth Program in Nepal

Project Number	DN-12
Project Title	UNNATI -Inclusive Growth Program in Nepal
Location	Sindhuli and Mahottari districts (Banepa – Bardiwas high way corridor. <i>Among the project area, 6 VDCs are form Sindhuli district one of the SRCAMP districts: Kuseswor Dumja, Jhangajholi Ratamata, Purano Jhangajholi, Bhimeswor, Baseshor and Bhuwanewhori Gwaltar.</i>
Objectives	<p>This project aims to increase the income and improve the livelihoods of small holder farmers in the districts of Sindhuli and Mahottari through Vegetable production and marketing and is expected to contribute to an overall economic growth in the agriculture sector and alleviate poverty with focus on these two districts along Banepa- Bardiwas highway corridor. The goal of the project is to improve livelihood of the small farmers through intervention of safe vegetable production and marketing of the products through cooperatives and/or private actors, targeting the markets of Kathmandu, Kavre, Janakpur and India. The project will cover 1000HHs in the road corridor.</p> <p>Expected Results are:</p> <ul style="list-style-type: none"> • 1000 small –holder farmer household are capacitated in commercial vegetable production • 1000 vegetable growing HHs organized in well functioning farmers’ groups and cooperatives • Four Farmers’ cooperatives provide high quality services to their members and link them to the market • Local dealers and agro vets provide high quality inputs to small scale farmers
Justification	Today, farmers are poor without bargaining power to sell their products in accordance to market demands, even though the demands are big in the main cities. The project will support farmers to get better access to small loans.and improve their products, both in quality and measure.
Project Description	<p>The founder of the project is the European Commission via Care Nepal. Main activities are as follows:</p> <ul style="list-style-type: none"> • Conduct market analysis, value chain mapping and women’s empowerment in Agriculture (WEA) framework analysis • Form farmers’ groups in areas where they do not exist and help these groups join inclusive cooperatives • Train existing and new cooperatives on organizational and financial management, technology use and social and gender inclusion and help them link with cooperative federation • Train farmers (at least 50%) women on vegetable production, post harvest handling, processing and on marketing and implementing business planand leadership • Support farmer’s groups and cooperatives to set up new collection centers, strengthen and run the existing collection centers effectively • Support small scale farmers to adapt climate change • Link local traders, cooperatives, agro vets and local nurseries with district agricultural development office, forestry

	user groups and other service provider
Project Duration	January 2013 to December 2015
Implementation Schedule	
Implementing Agency	Center for Environmental and Agricultural Policy Research, Extension and Development (CEAPRED)
Indicative Project Cost	Nrs. 37118944
Project Benefits	1000 HHs
Stage of Project	